# THE RELATIONSHIP BETWEEN ASTHMA EDUCATION AND THE NUMBER OF HOSPITAL VISITS OF ASTHMATIC CHILDREN

by

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Abstract

A retrospective study was conducted to determine the relationship between organized asthma education and the number of hospital visits for asthmatic children at a local children's hospital in northeastern Ohio. The database from the hospital's pediatric asthma disease management program was used to obtain data.

Pediatric asthmatic patients experiencing hospital visits due to their asthma were identified. Asthmatic children were studied who, along with their families, had participated in an organized asthma education program that followed the approved asthma education guidelines of the National Institutes of Health. Emergency department visits and inpatient visits were recorded for 12 months before and 12 months after intervention. Age, gender, ethnicity, and types of health coverage were identified. The numbers of hospital visits before education and the numbers after education were compared to determine the effect of organized asthma education on the number of hospitalizations of these patients.

A total of 90 asthmatic children were studied, each having had at least one hospital visit due to asthma prior to education. Overall, the analyses revealed a decrease in the number of inpatient admissions after education, but an increase in the number of emergency department visits following asthma education.

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# CHAPTER I

## INTRODUCTION

Asthma is a reversible chronic lung disorder, caused by airway reaction to a variety of stimuli. Approximately 14.6 million Americans suffer from asthma, 4.8 million of them being children under 18 years of age (ALA, 1998). According to the National Center for Environmental Health (NCEH), a subsidiary of the Center for Disease Control and Prevention (CDC), that number currently accounts for 7% of children in that age bracket. It is the leading serious chronic illness among children. The burden disproportionately affects African-American and Hispanic populations, appearing to be more severe in urban inner cities (CDC, 1998).

Although most of these children only experience mild to moderate symptoms that are controllable at home or by the family physician, some are plagued by acute exacerbations requiring numerous visits to the hospital emergency department. These visits often result in hospitalizations, sometimes to an intensive care unit. One estimate has asthma accounting for approximately 17 percent (one in six) of all pediatric emergency visits in the United States. In 1995, the rate among children less than five years of age was higher than any other age group, at 120.7 per 10,000. Blacks are almost four times as likely as whites to be hospitalized for asthma treatment (ALA, 1998). The degree of the disease severity differs from person to person. If not properly managed, asthma can be life threatening.

While asthma cannot be cured, it can be controlled with proper diagnosis and management. Pharmacologic intervention typically consists of a variety of medications, usually categorized into relievers and controllers. Relievers include bronchodilators used

for the treatment of acute episodes, or for treatment prior to exercise for those suffering from exercise-induced asthma. Preventive measures include anti-inflammatory agents, such as corticosteroids and cromolyn sodium. Since this latter group of medications prevents an asthma attack from starting, they must be taken on a regular daily basis even when the child is symptom free. Noncompliance is a frequent problem, especially when treatment regimens become complex and inconvenient for young children and their families. However, new medications with fewer side effects that have been developed in recent years are promising.

Aside from the effect of asthma on children's health, there are other long-term issues that come into effect. Quality of life may be affected as the parents of asthmatic children limit activities in fear of potential asthma attacks. The stigma of being a sickly child can be devastating as feelings of doom and of alienation from friends cause further problems. Frequent illness also influences the education of these children as well as the emotional and economic health of American families. The American Lung Association reveals statistics showing that childhood asthma accounts for 10.1 million school days missed annually, making it the number-one chronic condition causing school absenteeism for children less than 18 years of age (ALA, 1999). In addition, parents are often likely to miss work in order to care for a sick asthmatic child. Excluding the cost of medication, the economic impact of asthma in 1990 for those under 18 was over $2 billion (CDC, 1998). Both the direct and indirect costs of asthma can become overwhelming over time.

Patient education and open communication between the patient, family, and physician are important so that all are actively involved in the overall care plans. A wide

choice of asthma education programs is available by reputable organizations geared toward improved asthma management. By committing to a partnership, an individualized asthma management plan can be developed, leading to improved health and better quality of life.

## Statement of the Research Problem

Pediatric asthma prevalence has increased drastically in the United States over the last decade. It is a major reason for school absenteeism as well as for interference of parent productivity from staying home with a sick child with asthma. It is also the number one cause for pediatric hospitalizations in the United States. In the midst of escalating health care costs, a need exists to address the impacts of pediatric asthma.

## Statement of Purpose

The purpose of this study was to investigate the relationship between formalized asthma education and the number of hospital visits for pediatric asthmatics.

## Hypothesis

The hypothesis to be tested is: Asthmatic children who have received organized asthma education have fewer hospital visits than those children who have had no organized asthma education.

## Delimitations of Study

The study was delimited as follows: (1) subjects included children diagnosed with asthma, (2) ages up to and including 17 years of age, (3) both male and female were included, (4) all races were included, (5) patients who presented to the hospital were included.

## Limitations of the Study

1. Only pediatric patients that presented to the hospital were included. Those receiving medical care in a physician's office, other hospitals, or urgent care sites were not included.
2. Subjects included only those who were diagnosed with asthma as the primary admitting diagnosis.
3. Only the years 1998 through October 31, 2000 were included since the researcher did not have access to prior medical records.
4. Subjects transported into TCH from another referring hospital were excluded due to the inability to accurately follow the frequency of their hospital visits.

## Assumptions of the Study

Relative to this proposed study, the following assumptions are made:

1. The admitting physicians have properly and accurately diagnosed the subjects with asthma.
2. Children presenting to the hospital requiring treatment of asthma are considered to be in the moderate to severe category of disease as recognized by national guidelines.
3. Asthma education increases the patients' and families' quality of life (i.e. decrease number of hospital visits, decrease number of school days missed, decrease number of parent work days missed to care for a sick asthmatic child).

## Operational Definitions

Asthma – a bronchial hypersensitivity disorder characterized by reversible airway obstruction produced by a combination of mucosal inflammation, constriction of the bronchial musculature, and excessive secretion of viscid mucus, causing mucous plugs (Krupp & Chatton, 1981).

Asthma Education – participation of the child (age permitting) and the child's family in an educational session with a member of the hospital's asthma disease management team.

Hospital Visit – any occasion that the subjects had been brought to the hospital for asthma treatment, which consisted of emergency visits, observation status (24-hour) admissions, and inpatient admissions.

Prevalence – the proportion of a population that has a health condition at a given point in time. It consists of 3 factors: the case definition, the incidence rate of the condition (rate at which new cases occur in a population), and the mean duration of the condition (average time that an individual in the population has the health condition) (Brownell, 1986).

## Summary

Educating the asthmatic child and his or her family may lead to a more efficient use of hospital services. As the family is made aware of the full spectrum of the disease and the importance of medication compliance, they can more readily develop a partnership with the child's health care team.

Chapter II provides a review of the literature revealing the impact of childhood asthma in America.

Chapter III presents the study design, sample, and tools used to provide a form of organized asthma education to the child and family. The statistical methods used to determine the relationship between formalized asthma education and the number of hospital visits are also presented.

Chapter IV reveals the results of the data analysis along with a discussion of the relationship of asthma education with hospital visits.

Chapter V discusses the summary of the study, the findings, limitations, and implications. Recommendations for future research are presented.

# CHAPTER II

# LITERATURE REVIEW

The purpose of this study was to investigate the effects of formalized asthma education on the number of hospital visits for pediatric asthmatics. This chapter contains a review of select literature on pediatric asthma. Subtopics include an overview of asthma, prevalence, national and local demographics, direct and indirect costs. National Institutes of Health (NIH) guidelines for disease classification, treatment, management, and education are addressed. Overall consequences are discussed, providing the theoretical basis for the study.

## Overview of Asthma

"Asthma is a reversible obstructive lung disease, caused by an increased reaction of the airways to various stimuli" (ALA, 1999). If not properly managed, asthma can result in acute exacerbations that can be life threatening. The airways of asthma sufferers are characteristically inflamed and hypersensitive with bronchoconstriction when provoked by one of any number of irritants or triggers. Increased mucus production may promote coughing spells, which further constrict the airways, leaving the victim gasping for air. These events lead to inadequate air exchange that, in turn, can lead to respiratory failure.

The development and exacerbation of symptoms can be affected by environmental risk factors (e.g. animal dander, smoke, air pollution, dust and dust mites, cockroaches), psychosocial factors, and inadequate access to health care. Gender (boys more than girls), history of at least one parent with asthma, food allergies, and small birth size compromise some of the additional risk factors (Ratcliffe, 1997).

## National Asthma Statistics

### Prevalence and Demographics

The Center for Disease Control and Prevention (CDC) has released statistics indicating that asthma prevalence, morbidity, and mortality has increased in the United States at an alarming rate in the past decade, with children under 18 years of age being most affected. That statistic represents an estimated 4.8 million children (NIH, 1998). Between 1982 and 1995, the prevalence rate (per thousand persons) of asthma in the pediatric population rose from 40.1 to 74.9 percent, an increase of 86.8 percent in North America, making it among the highest in the world (ALA, 1999). The Asthma and Allergy Foundation of America (AAFA) researchers have also found asthma to be on the increase since the 1980's, with its prevalence higher among children than adults, and higher among blacks than whites (AAFA, 2000a).

### National Hospitalization Rates

According to the National Centers for Health Statistics (NCHS) National Hospital Discharge Survey, 1970-1997, hospital discharge rates for asthma have also risen. The hospital discharge rates (per 10,000 persons) for asthma increased in the population less than 15 years of age by more than 15 percent between 1988 and 1997. Over 44 percent of asthma discharges were in this age group, while only 22 percent of the population were less than 15 years old at the time (ALA, 2000b). One study conducted on the use of health services by African-American children on Medicaid suggested that there were more users of emergency department and inpatient services among African-American children than Caucasian children (Lozano, Connell, & Koepsell, 1995).

While the trend of hospitalization rates for all children with asthma has increased over the last decade, the average length of stay (ALOS) decreased. In the 1980's, ALOS had decreased from 5 days to 3.6 days, approximately a 25% change, while the ALOS for all other conditions remained stable (Halfon & Newacheck, 1986). The CDC reported an average length of stay of 3.4 days by 1993 (Headrick et al., 1996). The National Association of Children's Hospitals and Related Institutions (NACHRI) reported similar results. NACHRI's Children's Case Mix Comparative Data System examined utilization data from 1993 to 1996 for asthmatic children at 49 NACHRI member children's hospitals. The ALOS for diagnosis related group (DRG) 96 (Asthma/Bronchitis) in the pediatric population showed an overall decline in all categories during this time span, as summarized in Table 1.

Table 1. Average Length of Hospital Stay for 1993-1996: DRG 96

| Severity of Asthma | 1993 | 1996 | % Change |
|---|---|---|---|
| All | 2.92 | 2.67 | (8.56) |
| Minor | 2.62 | 2.32 | (11.45) |
| Moderate | 3.66 | 3.33 | (9.83) |
| Major | 5.56 | 4.97 | (10.61) |
| Extreme | 8.67 | 8.01 | (7.61) |

Source: National Association of Children's Hospitals and Related Institutions, 1997.

While this appears to be an improvement economically, interpretation must be cautiously concluded based on these data. Further study is needed to determine whether shorter length of hospital stays mean more efficient disease management or indicates physicians are discharging sick children earlier. If the latter is true, then it is vital that the

families be properly educated in the care of those children in order to prevent rebound episodes that result in readmission or increased risk of a fatal asthma attack.

## Mortality Rates

While death due to asthma is not common in the pediatric sector, it must not be taken lightly. Like prevalence and hospitalization rates, the largest increases in mortality rates due to asthma have been seen in the younger age groups. Despite the increase in mortality rate, however, asthma mortality is infrequent in the pediatric population (< 1.0 per 100,000) according to the National Center for Health Statistics, Final Vital Statistics Report, 1979-1997 (ALA, 2000b). Yet, a child's death is always a tragedy, especially when due to a treatable disease.

## Direct and Indirect Costs of Asthma

While asthma prevalence in the United States soared, so have the costs associated with it. At least $12.4 billion is spent every year on asthma according to the American Lung Association (ALA, 1999). Asthma-related costs are increasing at an alarming rate, estimated in the United States at $6.2 billion in 1990. Those costs were projected to more than double to $14 billion for the year 2000 (CDC, 1998). A separate study, sponsored by the Asthma and Allergy Foundation of America, estimated the annual cost of treating asthma in 1994 at $10.7 billion, with $3.2 billion going to those under 18 years of age (AAFA, 2000b). Asthma-related costs were divided into direct and indirect costs. Direct costs include direct medical expenditures, such as hospitalizations, doctors' visits, and medications. Indirect costs are those associated with asthma, such as lost productivity (parents staying home from work with a sick child), time lost from school, and costs

attributed to asthma deaths. Given current data, researchers from the AAFA were able to present a breakdown of asthma costs by age, as illustrated in Table 2.

Table 2: Costs of Asthma by Age in the United States, 1985-1994

| | Estimated Prevalence (percent) | Persons With Asthma (millions) | Direct Costs (millions of $) | Indirect Costs (millions of $) | Total Costs (millions of $) |
|---|---|---|---|---|---|
| All | 5.44 | 14.16 | 6,107.6 | 4,640.6 | 10,748.2 |
| 17 or Under | 7.34 | 4.98 | 1,958.2 | 1,215.5 | 3,173.7 |
| 18 or Older | 4.77 | 9.18 | 4,149.4 | 3,425.1 | 7,574.5 |

Source: Asthma and Allergy Foundation of America, 2000a.

## State and Local Statistics

### Prevalence and Demographics

Pediatric asthma prevalence rates were much more difficult to obtain at the state and local levels. In 1997, the American Lung Association reported 197,226 asthmatic children in the state of Ohio. While the total number of children in Ohio was not stated, the number of asthmatic children was given for individual counties. Ohio and three of its northeastern counties are displayed in Table 3 (ALA, 1997).

Table 3. Pediatric Asthma Population in Ohio and 3 Northeastern Counties, 1997

| | Number of Children |
|---|---|
| Ohio, Entire State | 197,226 |
| Columbiana County | 1,979 |
| Mahoning County | 4,688 |
| Trumbull County | 4,085 |

Source: American Lung Association, 1997.

While these numbers account for less than 6 percent of the state's overall number of asthmatic children, they are significant in the scope of their individual communities.

Fortunately, the pediatric mortality rate in Ohio is low. The Ohio Department of Health (ODH) reported mortality rates caused by asthma at the state and county levels. Rates for children less than 15 years of age for the entire state and for 3 counties in the northeastern portion of Ohio are illustrated in Table 4 (ODH, 2000).

Table 4. Pediatric Asthma Mortality Rates per 100,000 Population

| Age-Specific Rates: | | 1990-1992 | | 1993-1995 | | 1996-1998 | |
|---|---|---|---|---|---|---|---|
| | | Number | Rate | Number | Rate | Number | Rate |
| Ohio | < 1 Yr | 1 | 0.2* | 1 | 0.2* | 0 | 0.0* |
| | 1-4 | 2 | 0.1* | 4 | 0.2* | 3 | 0.2* |
| | 5-14 | 10 | 0.2 | 7 | 0.1 | 19 | 0.4 |
| Columbiana | < 1 Yr | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| | 1-4 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| | 5-14 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Mahoning | < 1 Yr | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| | 1-4 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| | 5-14 | 1 | 0.9* | 1 | 0.9* | 0 | 0.0 |
| Trumbull | < 1 Yr | 1 | 10.9* | 0 | 0.0 | 0 | 0.0 |
| | 1-4 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| | 5-14 | 0 | 0.0 | 0 | 0.0 | 1 | 1.1* |

*Rates based on 5 or fewer deaths are unstable.

Source: Ohio Department of Health, 2000.

## Direct and Indirect Costs Locally

Like local prevalence rates, local costs of pediatric asthma were also difficult to obtain. While actual local costs were unavailable, some estimates were found. Researchers at Rush Primary Care Institute applied the national trends to state and county census data, taking into account key demographic characteristics such as age, gender, and race. They used these trends to estimate state and county levels of prevalence and costs, as depicted in Table 5 (AAFA, 2000c). As one can see, Ohio as well as 3 counties in the northeastern portion of the state ranked similar to the national trend of asthma prevalence in the pediatric population.

Table 5: Costs of Asthma (17 and Under) in 3 Ohio Counties, 1994

| | Estimated Prevalence (percent) | Persons With Asthma (thousands) | Direct Costs (thousands of $) | Indirect Costs (thousands of $) | Total Costs (thousands of $) |
|---|---|---|---|---|---|
| Total State | 7.31 | 208.1 | 81,510 | 50,595 | 132,105 |
| Columbiana | 7.15 | 2.1 | 807 | 501 | 1,308 |
| Mahoning | 7.46 | 4.7 | 1,860 | 1,154 | 3,014 |
| Trumbull | 7.26 | 4.1 | 1,601 | 994 | 2,595 |

Source: Asthma and Allergy Foundation of America, 2000b.

The Ohio Department of Health reported the average hospital charges for hospitalizations in 1997, listed by diagnosis related group (DRG) codes. Pediatric asthma was categorized with Bronchitis (age 0-17) under DRG 983. While the list was incomplete, several hospitals in the northeast portion of the state reported hospital charges ranging from $2200 to $3400 per patient (ODH, 1998). These amounts were based on total charges for the DRG for non-governmental patients (not Medicare or

Medicaid). Outlier charges were also excluded from the calculations in order to obtain a more accurate estimate. An individual's asthma-related cost might differ significantly, however, due to such reasons as severity of disease, hospital charges, individual medical coverage, and access to medical care. Whatever the reasons, families with an asthmatic child must cope with the burdens that the disease places on them.

## Psychosocial Impact

The literature continually reveals that pediatric asthma is a major public health problem with widespread socioeconomic impact. According to the American Lung Association's 1998-1999 Lung Disease Date Report, asthma is among the ten most prevalent conditions, ranking third in causing limitation of activity. Asthma has also become the cause of more school absenteeism than any other chronic disease. Children with asthma miss twice as many school days as other children. It averages to 7.2 days/year for asthmatic children compared to 3.4 days/year for children without asthma (Taggart & Fulwood, 1993). A child's asthma frequently moves across a continuum of severity, from mild to moderate to severe, causing major upsets in the family's lifestyle. According to a study by Weiss and others, a family with a moderate to severe asthmatic child might spend an estimated 6.4 percent of their yearly income on asthma-related expenses. These costs could increase to $100,000 per year for the family of a severe asthmatic (Tinkelman, Flaum, & Lung, 1997), resulting in severe hardships. Missed school days and lost workdays place a strain on all those individuals.

Despite the amount of impact, many patients and their parents have claimed that asthma is easy to control. Their concept of control, however, frequently means maintaining a high tolerance for asthma symptoms and accommodating lifestyles around

the asthma. Families attempt to cope with the burdens that asthma places on them rather than attempting to limit those burdens. Quality of life for both the child and the family are affected as they attempt to deal with the disease in this manner.

## Disease Management

Over the years better understanding of the disease itself along with the development of new, more effective medications has brought about an evolution in asthma management. What began as treatment of episodic symptoms has progressed to quite a different approach. Past practice consisted of treating asthma as symptoms appeared, concentrating on the "quick relief" medications. A trip to the emergency department typically resulted in an injection of adrenaline and a take-home prescription for theophylline. A child with more severe asthma might be sent home with a portable nebulizer to deliver aerosolized bronchodilator medications. Very little monitoring and teaching was being performed.

Fortunately, years of research have produced improved methods of therapy. New preparations of bronchodilators have been packaged in metered-dose inhalers that have allowed increased mobility for even a severe asthmatic. The emphasis on the importance of the inflammatory process of asthma has led to promising medications, such as leuketriene modifiers and more efficient anti-inflammatory preparations that can be used on young children. Medications in tablet form, taken once or twice a day have in some cases replaced the need for lengthy aerosol treatments. New delivery methods and devices have enhanced the ability of practitioners to administer medications to the younger population of asthmatics. More efficient and more convenient methods of

treatment have helped improve the management of pediatric asthma. These accomplishments were not enough, however.

## NIH Guidelines

As managed care and capitated reimbursement emerged, it became necessary for health institutions to evaluate the cost-effectiveness of their treatment methods. In June of 1988, a nationwide initiative to improve the overall management of asthma was undertaken by the National Institutes of Health (NIH) through their National Heart, Lung, and Blood Institute (NHLBI). Under the auspices of the National Asthma Education and Prevention Program (NAEPP), a multidisciplinary panel of clinicians and scientists with expertise in asthma management was organized. The panel worked to develop an overall approach to asthma diagnosis and management based on current knowledge (NIH, 1998).

First published in 1991, the report has been reviewed, revised, and expanded. The updated panel report was published in 1997, providing extensive information to help patients and their health care providers make appropriate and practical decisions about their asthma care. Reducing mortality and morbidity as well as decreasing costs meant incorporating asthma management programs into the clinical management of asthma patients. The results of the report meant a massive movement toward standardized disease management.

## Assessment and Monitoring

One result of their efforts was a new definition of asthma with an emphasis on the role of inflammation of the airways:

> "In susceptible individuals, this inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness, and cough, particularly at night and in the early morning. These episodes are usually associated with widespread but variable airflow obstruction that is often reversible either spontaneously or with treatment. The inflammation also causes an associated increase in the hyperresponsiveness to a variety of stimuli" (NIH, 1998, p.3).

Redefining asthma gave way to a new focus of how asthma would be managed, concentrating on preventing and minimizing recurrent exacerbations. To accomplish this more effectively, the panel developed a classification system for asthma based on frequency and severity of symptoms as well as basic lung function (Table 6).

Table 6. Classification of Asthma Severity

Clinical Features Before Treatment*

| | Symptoms | Nighttime Symptoms | Lung Function |
|---|---|---|---|
| Severe Persistent | • Continual symptoms<br>• Limited physical activity<br>• Frequent exacerbations<br>• | Frequent | • FEV1 or PEF≤60% predicted<br>• PEF variability>30% |
| Moderate Persistent | • Daily symptoms<br>• Daily use of inhaled short-acting beta2-agonists<br>• Exacerbations affect activity<br>• Exacerbations≥2 times/week; may last days<br>• | > 1time/week | • FEV1 or PEF>60%to<80% of predicted<br>• PEF variability>30% |
| Mild Persistent | • Symptoms>2 times/week but < 1 time/day<br>• Exacerbations may affect activity | ≤ 2 times/month | • FEV1 or PEF ≥80% predicted<br>• PEF variability 20-30% |
| Mild Intermittent | • Symptoms< 2 times/week<br>• Asymptomatic and normal PEF between exacerbations<br>• Exacerbations brief (from a few hours to a few days); intensity may vary<br>• | ≤ 2 times/month | • FEV1 or PEF≥80% predicted<br>• PEF variability< 20% |

* The presence of one of the features of severity is sufficient to place a patient in that category. An individual should be assigned to the most severe grade in which any feature occurs. The characteristics noted in this figure are general and may overlap because asthma is highly variable. Furthermore, an individual's classification may change over time.

** Patients at any level of severity can have mild, moderate, or severe exacerbations. Some patients with intermittent asthma experience severe and life-threatening exacerbations separated by long periods of normal lung function and no symptoms.

Source: National Institutes of Health, 1998, p. 20.

The new classification of asthma severity helped institute more extensive guidelines for accurate assessment of a child's asthma. A careful medical history and pulmonary function tests were recommended. Conducting a thorough assessment of signs and symptoms can help identify the variability between patients as well as within each patient over time. The Expert Panel recommends regular monitoring of pulmonary function, to be done: (1) with initial assessment; (2) after stabilization of condition, to determine (near) "normal" airway function; and (3) preferably every 1 to 2 years for ongoing assessment (NIH, 1998). In addition, children periodically can perform a Peak Expiratory Flow (PEF), either on their own or with the help of an adult, to determine the existence and severity of airflow obstruction. This simple and inexpensive procedure, performed with a portable peak flow meter, places the child's expiratory flow reading in a category or "zone" of severity, based on what his or her best or predicted value should be. The child (or parent) can then follow a plan of action that was previously instructed by the physician. Utilization of available assessment tools leads to a more accurate assessment of condition. It would, in turn, bring about a treatment regimen tailored specifically for each individual patient.

## Partnership in Care

All these recommendations, however, demand commitment from the physician, patient, family, and entire health care team. Shifting from symptomatic to preventative therapy means a change in treatment approach, such as routine medications, environmental control, and patient education. This approach is especially true for those at high risk.

Successful asthma management programs have consisted of a comprehensive approach to treatment through a multidisciplinary team of health care providers. Countless articles have documented the potential success of asthma management programs and clinical pathways that have used this approach. As far back as 1991, Evans and Mellins had discussed the benefits of various educational programs for children with asthma. More recent literature reveals similar advantages. One study in Wisconsin showed a decrease in health care costs by almost $100 per patient in one year for those patients included in an asthma management program (MacKinnon, Flagstad, Peterson, & Mesch-Beatty, 1996). Another study published in 1996 performed a cost comparison with various treatment settings dealing with pediatric asthmatic patients, citing the importance of asthma self-management programs to decrease emergency room costs (Coventry, Weston, & Collins, 1996). Researchers at St. John Hospital and Medical Center in Detroit, Michigan presented results before and after implementation of their asthma disease management program with positive results (Ross, Togger, & Desjardins, 1998). Higgins, and others (1998) also supported asthma intervention, concluding that all measured parameters in their study showed favorable changes after intervention. The literature represents an overwhelming support of asthma education and intervention.

## Asthma Education

Since a main objective of asthma management is to prevent and minimize recurrent acute episodes, educational programs must be comprehensive in design. As stated in the NIH Guidelines, "Current management approaches require patients and families to effectively carry out complex pharmacologic regimens, institute environmental control strategies, detect and self-treat most asthma exacerbations, and

communicate appropriately with health care providers" (NIH, 1998, p. 124). They should identify and facilitate a partnership between the child, family, physician, and other caretakers, extending even to the child's school system (teachers and administrators). Patient education is an essential component of successful asthma management and should be integrated throughout the child's care.

National guidelines recommend that several key components be covered in effective asthma education. They include basic facts about asthma, roles of medications, treatment and assessment skills, environmental control measures, and procedures for rescue actions (NIH, 1998). Recipients should understand the difference between normal and asthmatic airways; they should understand what happens to the airways during an asthma attack. With a complex medication regimen, patients need to know how each type of medication works as well as how and when it should be taken. The difference between long-term controllers and quick relievers must be stressed. Patients must be instructed on proper use of medication delivery devices, such as inhalers and spacers. Children and their parents must also be taught skills in symptom monitoring and record keeping. The "how" and "when" of peak flow monitoring is designed to help them learn to recognize early signs of deterioration, by observing what "zone" they are able to achieve at any one time. Families and other caregivers also need to become active partners, especially when the patient is too young or unable to understand. Identifying and eliminating environmental irritants and triggers will help avert recurrent episodes. Finally, the patient and family must know how to respond to changes in asthma severity. Taking the correct medications or coming to the hospital may mean the difference between life and death. These components of asthma care can be incorporated into a

daily self-management plan and action plan tailored to the individual patient and his/her family.

## Noncompliance

While an asthma management plan may appear to be straightforward, it often becomes difficult to implement and maintain. Patient compliance is a common problem that can be the result of any number of factors. A family having financial difficulties may not regularly purchase asthma medication, causing a lapse in the treatment regimen. A lapse in preventative medication can result in deterioration of the asthmatic child, requiring a trip to the emergency department and possible hospitalization. Social factors are frequently difficult to alter. Busy lifestyle and peer pressure may affect patient compliance, especially in the adolescent patient. Advising family members to quit smoking in the home or to find a new home for the family pet is often met with resistance. These examples are just a few of the explanations for noncompliance. Whatever factors are involved, the family's understanding for the potential severity of the disease is vital. If asthma is not perceived as a life-threatening disease, adherence to any type of treatment plan cannot be expected.

## Perceptions and Misconceptions

Adherence to medical treatment is also linked to the family's perception of asthma. Misunderstanding of asthma and its treatment options appeared to be prevalent throughout the literature. According to a survey reported by the American Lung Association, 79% of parents surveyed did not understand the difference between controller medicines that prevent an asthma attack from occurring and reliever medicines that stop symptoms after they have begun (ALA, 2000a). In a survey done in Chicago, it

was revealed that less than half of the inner-city residents questioned knew about proper treatment for asthma (Conway, Hu, Bennett, & Niedos, 1999). The "Asthma in America" survey that was funded by Glaxo Wellcome, Inc., also found widespread misunderstanding about the causes and treatment of asthma. Their survey of asthmatics (or parents of asthmatics) in Cleveland, Ohio revealed that only 10% could name inflammation as the underlying cause of asthma symptoms; 46% thought it possible to treat only asthma attacks and symptoms, not the underlying cause (Asthma in America, 1998).

The differences in understanding of the disease terms among physicians, asthmatic children, and parents of affected children also raises an issue. Although asthma is classically associated with wheezing and breathlessness, interpretation of the symptoms differs. A study published in the Archives of Disease in Childhood examined the perceptions of children hospitalized with acute asthma. Twenty-seven children were evaluated on their perception of breathlessness, twelve of which were hypoxic at admission. The researchers concluded that the hypoxic children tended to perceive themselves as less breathless than the children who were not hypoxic, predisposing them to a potentially life threatening attack in the future (Male, Richter, & Seddon, 2000). Another study compared parental reports of wheezing with clinicians' findings of wheezing and asthma. The investigation revealed that only 45% of parents and clinicians agreed that the child was wheezy or had asthma (Cane, Ranganathan, & McKenzie, 2000).

## Summary

Asthma is a major health problem in the United States, especially in the pediatric population. The literature supports an overwhelming need for aggressive treatment coupled with asthma education. Education for the patient and the primary caregivers is essential. Tailoring the treatment regimen to each individual patient and simplifying the overall treatment plan will hopefully result in more favorable outcomes in the future.

# CHAPTER III

# PROCEDURES

Chapter III provides a description of the methodology used in the study to determine the effects of organized asthma education on the number of hospitalizations of asthmatic children. An explanation of the study design, population, and the statistical methods used to measure the relationship between asthma education and numbers of hospitalizations are discussed.

## Research Design

A retrospective study was done to examine the data of asthmatic children who had received treatment for asthma in a hospital setting. A database for pediatric asthmatic patients was used to collect data in order to determine the effects of asthma education on the number of hospital visits for each child. The number of hospital visits from 1998 through 2000 both before education and after education were examined. Asthma education was defined as the participation of the child (age permitting) and the child's family in an educational session with a member of the hospital's asthma disease management team. Hospital visits were defined as occasions that the subjects had been brought to the hospital for asthma treatment, which consisted of emergency visits, observation status (24-hour) admissions, and inpatient admissions.

## Setting

The study was conducted at a local children's hospital located in Mahoning County in Northeast Ohio, which mainly serves the communities of Trumbull, Mahoning, and Columbiana Counties.

## Population

The population for the study consisted of 88 pediatric patients, 1 through 17 years of age, who presented to the hospital for treatment of asthma. Both males and females were included. The sampling was inclusive of all payer types (private insurance, Medicaid, and self-pay).

## Program/Treatment

All information and educational materials utilized in this research were developed and approved by the hospital's Pediatric and Adolescent Asthma Disease Management team, under the direction of a medical director. The educational tools and procedures had been established and were in effect prior to and during the time researched. They included such things as an information booklet on pediatric asthma, instructions on how and why to use a spacer with metered-dose inhaler medications, record-keeping sheets, and medications information. Measures to ensure the privacy of the patients and their families have been addressed for this study. Appendix A lists the precautions taken to provide patient confidentiality.

The educational program provided for asthmatic children and their families consists of information and materials that follow the National Institutes of Health (NIH) and National Asthma Education and Prevention Program (NAEPP) guidelines. According to hospital procedure, a clinical pathway is placed in each patient's medical chart upon admission to the hospital having a primary diagnosis of asthma. Standing orders consist of standard and accepted treatment options for pediatric asthma, including medications with delivery options and asthma education. The physician tailors the orders to the individual needs of the patient. Respiratory therapists assess the patient, administer

the aerosolized medications, and instruct the patient and family on correct procedures for medication delivery. The therapists also teach any child 5 years or older proper use of a peak flow meter along with recording the measurements.

Asthma education is automatic, referring the patient to the Child Life and Education Department, at which time a staff member then completes a questionnaire with the family in order to obtain a relevant history of the child's asthma. The education process begins when the patient's condition is stabilized. Under the direction of the program's coordinator, the patient and family are instructed on the various aspects of asthma. Such subjects as pathology, signs and symptoms, triggers, and avoidance measures are discussed in a nonthreatening way. Videos are used as teaching aides for younger children. Prior to discharge from the hospital the family is supplied with a peak flow meter, a spacer for the child's metered-dose inhaler medications, easy-to-read medication sheets (color-coded for each type of medication being taken), and other helpful information. If the patient's length of stay in the hospital does not allow adequate time for proper instruction, another session is scheduled on an outpatient basis. In addition, a patient/family education intervention documentation form is completed as each phase of instruction takes place. If the family refuses to complete the educational process, notation is made on the documentation form and the physician is notified. Duplicates of the form are sent to the Child Life and Education Department and to the child's attending physician, while the original form remains in the child's medical chart. Thus, those involved in the child's asthma care plan are able to follow the educational process. The documentation form is displayed in APPENDIX B.

## Data Collection/Instrumentation

Subjects chosen for the study were those children who had presented to the hospital (either in the emergency department or as an inpatient) with a primary diagnosis of asthma requiring one or more respiratory treatments. Asthmatics who, during the study time, had a primary diagnosis other than asthma (even though asthma may have been a secondary diagnosis) were excluded from the research due to the possibility of additional effects on the number and length of hospital visits for the subjects. Data for the research was obtained from the Pediatric and Adolescent Asthma Disease Management Program's database. Available data included patient demographics, dates and types of hospital visits, and dates of educational intervention. Since the study was retrospective in nature, there was no contact with the patients or families. Permission to access and use the database for this research was granted by the hospital's Medical Chairman of Pediatric and Adolescent Medicine (APPENDIX A).

The number of hospitalizations was compared before and after participation in asthma education for each child and his or her family. The observed time interval was determined by the date of educational intervention, encompassing one year before the education through one year after the education, specific for each individual. Only the years 1998 through October 31, 2000 were included since the researcher did not have access to prior medical records. Hospital encounters were separated into two categories: emergency (ER) visits and inpatient (including 24-hour observations) visits. Thus, the effect of education on the number of hospital visits could be further expanded to include the types of visits.

Each 2-year period was contained within the specified time of the design, but varied depending on when the child received asthma education. The duration of pre- and post-education time periods allowed for consistency between subjects in relation to season change, which otherwise might have had an influence on the number and severity of acute asthma attacks. For this reason, subjects less than one year of age at the time of education were excluded since they could not be tracked for a full year prior to education. In addition, any patients who were transferred in from another facility were also excluded, since hospital visits to the referring hospital could not be tracked.

## Data analysis

The Statistical Package for the Social Sciences (SPSS), Version 8.0 for Windows, was used to analyze the data of this research project. Demographic variables of ethnicity and type of insurance were examined for effects among the subjects participation in education and utilization of hospital services for treatment of asthma.

The Paired Samples t-test was performed on the pre- and post- education hospital visits to determine if there was a relationship with educational intervention.

## Summary

Chapter III identified the research methodology used to determine the effects of asthma education on the number of hospital visits for asthmatic children. The various aspects of the educational intervention were explained and the criteria for subject selection were described. Demographic data were used to describe the sample population. The statistical methods outlined in this chapter are presented in Chapter IV.

Further summarization and conclusion of the study findings are presented in Chapter V. The final chapter also includes implications of the study along with recommendations for further research.

# CHAPTER IV

## ANALYSIS OF DATA

Information from the pediatric asthma database was used to determine the effects of asthma education on the number of hospitalizations for asthmatic children. The data were calculated to test the research hypothesis: Formalized asthma education decreases the number of hospital visits for asthmatic children. The Statistical package for the Social Sciences (SPSS) was used to analyze the data.

### Demographic Profile of the Sample Population

A total of 90 pediatric asthmatic patients who had presented to a local children's hospital during 1998 through 2000 for treatment of asthma were studied. All of the subjects had participated in asthma education sessions during 1999; the year prior to education as well as the year after education was analyzed.

The demographic data revealed the patients' ages ranged from one to sixteen years. While the mean age was 5.8 years, the most common age of patients that received education was one year. Forty-five (50%) of the subjects studied were under five years of age, underscoring the 1995 national trend of the age bracket with highest asthma rates. The ratio of males to females was 66.7% males to 33.3% females, also reflecting national trends. Caucasians accounted for 48.9% of the sampling while African-Americans accounted for 43.3% of the sampling. Other categories of ethnicity included Asian (1.1%), Hispanic (1.1%), Other (1.1%), and Unknown (4.4%). Additionally, 48 of the subjects had hospital costs covered by Medicaid, while 36 of the subjects had private insurance coverage, 53.3% and 40.0% respectively. These statistics are summarized in Table 7.

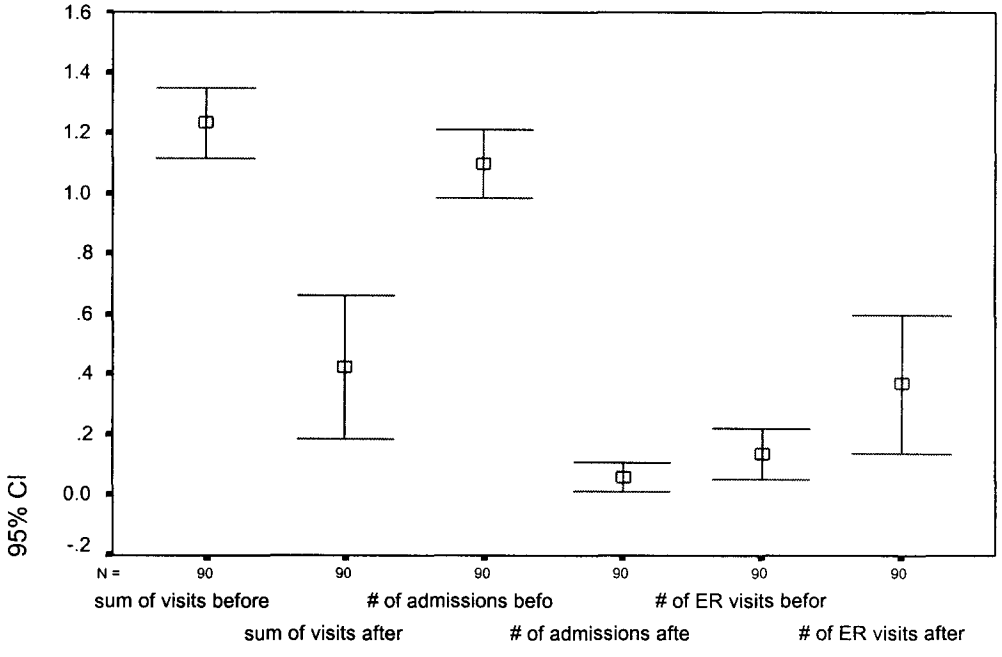
Table 7. Demographic Data of Children Enrolled in Asthma Study

| Variable | n | Percent |
|---|---|---|
| Age | | |
| 1 | 20 | 22.2% |
| 2 | 8 | 8.9% |
| 3 | 12 | 13.3% |
| 4 | 5 | 5.6% |
| 5 | 8 | 8.9% |
| 6 | 4 | 4.4% |
| 7 | 8 | 8.9% |
| 9 | 2 | 2.2% |
| 10 | 3 | 3.3% |
| 11 | 3 | 3.3% |
| 12 | 5 | 5.6% |
| 13 | 5 | 5.6% |
| 14 | 4 | 4.4% |
| 15 | 2 | 2.2% |
| 16 | 1 | 1.1% |
| Gender | | |
| Male | 60 | 66.7% |
| Female | 30 | 33.3% |
| Ethnicity | | |
| Caucasian | 44 | 48.9% |
| African-American | 39 | 43.3% |
| Asian | 1 | 1.1% |
| Hispanic | 1 | 1.1% |
| Other | 1 | 1.1% |
| Not Reported | 4 | 4.4% |
| Insurance Coverage | | |
| Medicaid | 48 | 53.3% |
| Private | 36 | 40.0% |
| Self-Pay | 1 | 1.1% |
| Not Reported | 5 | 5.6% |

Descriptive Statistics

The number of educational interventions for each child ranged from one to seven, with 66 (73.3%) of the 90 subjects receiving a single session. Among all the observed subjects, a total number of 111 hospital visits occurred before education while only a total of 38 hospital visits occurred after education. The raw numbers were deceiving, however: the range of total hospital visits before education was one to three visits while the range of total hospital visits after education was zero to seven. Separating the number of visits into ER visits and inpatient (IP) visits yielded further information. A total of 12 ER visits ranged from zero to two before education for each child, while a total of 33 ER visits ranged from zero to seven after education for each child. The distributions are summarized in Figure 1.

Figure 1. Distribution for the Number of Hospital Visits Associated with Education



A paired samples t-test was conducted to evaluate whether or not a significant relationship existed between the number of hospital visits and educational intervention. The results indicated that the mean number of total hospital visits before education was significantly greater than the mean number of total hospital visits after education (mean difference = .81, $t$ =6.7, $p < .05$). The paired samples t-test also resulted in a significant relationship between the number of ER visits before and after education (mean difference = -.23, $t$ =-2.3, $p < .05$), though the results were counter to the research hypothesis. The sample population had a mean number of ER visits after education that was greater than the mean number of ER visits before education. On the other hand, the total number of IP visits before education (99) ranged from zero to three for each child, while the total number of IP visits after education (five) ranged from zero to one for each child. While again there was a significant relationship between number of IP visits and education, (mean difference = 1.04, $t$ =16.6, $p < .05$), the data now supported the research hypothesis. The numbers of admissions into the pediatric intensive care unit (PICU) were also calculated. Ten patients encountered PICU admissions, each only one time. None of the patients were admitted to the PICU in the year after education (Table 8).

Table 8. Relationship Between Hospital Visits Before and After Education

| | # Before Education | # After Education | Mean Diff | S.D. | t | Sig. |
|---|---|---|---|---|---|---|
| Sum of Visits | 111 | 38 | .81 | 1.15 | 6.7 | p = .000 |
| ER | 12 | 33 | -2.3 | .97 | -2.3 | p = .025 |
| Inpatient | 99 | 5 | 1.04 | .60 | 16.6 | p = .000 |
| PICU | 10 | 0 | .11 | .32 | 3.3 | p = .001 |

Relationship is significant at $p < .05$ level

The data were also explored for a relationship between the number of hospital visits and the number of educational interventions for each child, using an independent samples t-test. The subjects were categorized as those individuals who had a single educational session and those who had more than one educational session during the study time. Twenty-four children had a single educational session while 66 children had more than one educational session. The data from all types of visits resulted in a significant relationship between those children who had one educational session and those who had multiple educational sessions, except for the PICU visits since there were no PICU admissions after educational intervention. The data are displayed in Table 9.

Table 9. Relationship Between hospital visits and multiple educational sessions

| Types of Visits | t | p |
|---|---|---|
| Total | $t(90) = 2.6$ | $p = .001$ |
| ER | $t(90) = 2.3$ | $p = .001$ |
| IP | $t(90) = 1.7$ | $p = .001$ |

Relationship is significant at $p < .05$ level

## Summary

A total of 90 pediatric asthmatic patients were studied, all participating in asthma education during the observed time. Demographic data reflected that the subjects' ages ranged from one to 16 years, with one year of age most frequent. Fifty percent of the subjects were under five years of age. The ratio of male to female subjects was 66.7% males to 33.3% females. Caucasians accounted for 48.9% of the sampling while African-Americans accounted for 43.3% of the sampling. The majority of patients were covered by Medicaid (53.3%) followed by private insurance (40.0%). In data analyses, it was

revealed that overall, the number of hospital visits decreased significantly after asthma education. The mean number of emergency visits, though significant, showed an inverse relationship, increasing after education. The mean number of inpatient admissions, however, did parallel the statement of hypothesis.

The study is further summarized in Chapter V. Conclusions of the study are presented as well as recommendations for further study.

# CHAPTER V

# SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

## Summary

Asthma is a chronic disease that affects approximately 4.8 million children under 18 years of age in the United States alone (American Lung Association, 1998). It is the leading serious chronic illness among children, and accounts for approximately 17% (one in six) of all pediatric emergency visits in this country (Centers for Disease Control, 1999). The emergence of managed care and capitation of health care dollars has motivated health care institutions to take a more comprehensive approach to overall disease management. Great strides have been over the years in dealing with the problems of asthma both through better understanding of the disease process itself and through development of new, more effective medications. At the same time, society has become more health conscious, with more emphasis on prevention. Thus, the development of disease management programs has flourished. Good programs are continuously assessed for quality improvement.

The purpose of this study was to determine the effects of organized asthma education on the number of hospital visits of asthmatic children at a local children's hospital. Selected sociodemographic variables (age, gender, ethnicity, and health care coverage) were investigated to show if local statistics paralleled those nationally. Identifying specific sociodemographic variables may help in targeting the appropriate populations for asthma education.

The hypothetical approach to the study was that participation in organized asthma education decreases the number of hospital visits for the asthmatic child. The theory is

generally accepted today that if a patient and family are adequately educated, most cases of childhood asthma can be properly managed at home or by the family physician.

Information obtained from the database provided data to determine the effects of education on the number of hospital visits for each child and correlate the effects of that education to selected types of hospital admissions: i.e. emergency visits and inpatient admissions.

## Conclusions

Information obtained from the study revealed the following:

- A total of 90 patients ranged from the age of one to 16 years of age, with 50% of the patients being less than five years of age, following the national trend of the age bracket with highest asthma rates.
- The ratio of males to females (66.7% to 33.3% respectively) also reflects national trends.
- Caucasians accounted for 48.8% while African-Americans accounted for 43.3% of the sampling. It did not quite reflect national statistics that claim higher proportions of asthma in African-American and Hispanic cultures. However, the small sample size of this study may not be an ideal representation of various cultures.
- 53.3% of the subjects were covered by Medicaid, 40% by private insurance, edging the common impression that lower socioeconomic children and those in urban areas have a higher incidence of asthma.
- A cumulative total of 111 hospital visits occurred before education compared to a cumulative total of 38 hospital visits after education, showing a significantly favorable relationship between education and number of hospital visits.

- Dividing hospital visits into emergency department and inpatient admissions yielded varied results. While significant relationships existed for both types, emergency visits increased after education from 12 to 33 visits, ranging from zero to seven visits. Only one patient had seven emergency visits after education. The remainder of the patients ranged from zero to four emergency visits. Inpatient admissions decreased drastically after education from 99 to five visits. The length of stay for inpatient visits ranged from one to 14 days before education compared to one to two days after education. Similarly, one patient had a lengthy hospital stay (14 days). The remainder of inpatient days ranged from one to three days. Thus, it appears that a significantly positive relationship continues to exist between education and the number of hospital visits. A possible explanation: while some patients continued to present to the hospital, educational intervention had helped to decrease the severity of asthma attacks requiring hospital admission.

- 10 children experienced a single admission the pediatric intensive care unit (PICU) prior to education; none were admitted to the PICU within a year after education. One should develop conclusions cautiously from this variable. While it appears that education had a favorable effect on PICU admissions, one cannot ignore the fact that such a severe life-threatening experience may by itself attain positive consequences.

- The number of educational interventions for each child ranged from one to seven sessions. It is difficult to accurately determine the cause and effect relationship between the number of educational session and the number of hospital visits.

## Implications

Overall, the findings of this research have demonstrated favorable results: participation in organized asthma education helps to decrease the number of hospital visits for asthmatic children. Yet one must recognize the fact that the majority of the subjects who had participated in the educational program were under five years of age. The implication may be that these patients had been recently diagnosed and families are eager to receive information. Older children and their families may have felt that they already have enough asthma information and know how to handle their own situations. Teenage asthmatics may be influenced by peer pressure, not wanting to return for further information. The reader must also keep in mind that even though most of the patients participated in only one educational session, they had received some instruction with every hospital visit, as described in Chapter III. Ongoing education promotes the reinforcement of information and helps to keep the families updated on new developments in the treatment of the child's asthma.

One approach to explain health behavior as related to the children's hospital visits was addressed in a study done in Chicago in 1998. It supports the health belief model that "individuals will take action if they perceive themselves as susceptible to an ill-health condition, and if they believe the condition will lead to serious consequences and that a beneficial course of action is available to them" (Conway, Hu, Bennett, & Niedos, 1999, p. 231S). If the family does not perceive the child's asthmatic condition as a serious health threat, behavior modification is unlikely to occur.

## Recommendations for Further Research

More studies to determine the effects of asthma education on the number of hospital visits are warranted. It is not clear whether the scope of this study accurately reflects the pediatric asthma population in northeastern Ohio. A more comprehensive study may validate whether the subjects had asthma education prior to the duration of this study and what impact it had on previous hospitalizations. Additional research into various aspects of pediatric asthma should be conducted for longer periods of time.

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# APPENDIX A

# ETHICAL CONSIDERATIONS / HUMAN SUBJECTS PROTECTION / LETTER OF PERMISSION

## Ethical Considerations

To ensure that adequate privacy was included and respected in this study, the following principles were applied to the data:

1. All patients' legal rights were respected. Their rights to privacy were maintained through confidentiality of all personal data.
2. No contact was attempted or made with the patients or their families since the study involved only the use of retrospective data.
3. The results of the research study were available upon request.

Youngstown State University / One University Plaza / Youngstown, Ohio 44555-0001

February 28, 2000

Dr. Carolyn Mikanowicz, Professor
Ms. Marilyn Walton, Graduate Student
Department of Health Professions
CAMPUS

RE: HSRC Protocol #81-2000

Dear Dr. Mikanowicz and Ms. Walton:

The Human Subjects Research Committee of Youngstown State University has reviewed the protocol you submitted, Protocol #81-2000, "The Effect of Asthma Education on the Number of Hospitalizations for Asthmatic Children," and determined that it is exempt from full committee review based on a DHHS Category 4 exemption.

Any changes in your research activity should be promptly reported to the Human Subjects Research Committee and may not be initiated without HSR approval except where necessary to eliminate hazard to human subjects. Any unanticipated problems involving risks to subjects should also be promptly reported to the Human Subjects Research Committee.

Sincerely,

Eric Lewandowski (cc)

Eric Lewandowski
Administrative Co-chair
Human Subjects Research Committee

ECL:cc

c: Mr. Joseph Mistovich, Chair
Department of Health Professions

Forum
HEALTH

# Memo

**Date:** 9/22/99

**To:** Whom It May Concern

**From:** Robert Felter, MD, Chairman of Pediatric and Adolescent Medicne

**Subject:** Permission to use hospital data for thesis

Marilyn Walton has permission to use data from the pediatric asthma database at Forum Health for her thesis for Youngstown State University. The thesis will be directed toward the effect of asthma education on the number of hospitalizations for children in this area.

# APPENDIX B

# ASTHMA EDUCATION FORM

Forum
HEALTH

# INTERDISCIPLINARY TEACHING GUIDELINE INPATIENT/OUTPATIENT PEDIATRIC/ADOLESCENT ASTHMA

Addressograph

INSTRUCTIONS:

- **Refer to disease specific teaching guideline book for behavioral objectives, content, method codes and teaching resources.**
- Date and initial each **assessed and reassessed educational need identified.**
- Upon completion of **teaching, date/initial , document the outcome code** and identify initials/profession at bottom of form.

**CODES: PT= patient CG= caregiver**

OUTCOME CODES:

1. Communicates understanding of objectives
2. Returns demonstration satisfactorily
3. Unable to communicate understanding of objectives
4. Returns demonstration needing minimal improvement
5. Needs significant review and improvement
6. Refused teaching
7. Primary caregiver unavailable for teaching

| ASTHMA | Need identified Date/Initial | | Outcome Code Date/Initial | | Outcome Code Date/Initial | | Outcome Code Date/Initial | | Outcome Code Date/Initial | |
|---|---|---|---|---|---|---|---|---|---|---|
| TOPICS | PT | CG | PT | CG | PT | CG | PT | CG | PT | CG |
| I. Understanding of disease | | | | | | | | | | |
| a. respiratory system | | | | | | | | | | |
| b. signs and symptoms | | | | | | | | | | |
| c. triggers | | | | | | | | | | |
| II. Medications | | | | | | | | | | |
| a. prescription drugs | | | | | | | | | | |
| b. non-prescription drugs | | | | | | | | | | |
| c. MDI/Spacer | | | | | | | | | | |
| d. nebulizer | | | | | | | | | | |
| III. Self-Management | | | | | | | | | | |
| a. peak flow meter | | | | | | | | | | |
| b. action plan and record keeping | | | | | | | | | | |
| c. communication | | | | | | | | | | |
| d. trigger avoidance | | | | | | | | | | |
| e. early recognition/rest | | | | | | | | | | |
| f. avoiding emergency and hospitalizations | | | | | | | | | | |
| IV. Exercise | | | | | | | | | | |
| a. asthma/exercise | | | | | | | | | | |
| b. preparation | | | | | | | | | | |
| c. breathing exercises | | | | | | | | | | |
| V. Diet Management | | | | | | | | | | |
| a. asthma/food allergies | | | | | | | | | | |
| b. basic diet information | | | | | | | | | | |
| VI. Psychosocial Care | | | | | | | | | | |
| a. emotional aspects | | | | | | | | | | |
| b. hospital/community national resources | | | | | | | | | | |
| c. financial assistance | | | | | | | | | | |
| d. support groups/programs | | | | | | | | | | |
| e. sibling issues | | | | | | | | | | |
| VII. School | | | | | | | | | | |
| a. inpatient | | | | | | | | | | |
| b. liaison program | | | | | | | | | | |

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