NUTRITION AND EXERCISE EDUCATION FOR CHILDREN WITH ASTHMA

(NEECA)

by

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ABSTRACT

The purpose of this masters’ report is to present plans to implement and evaluate an evidence based program to improve eating patterns and physical activity among school-age children attending a summer camp for children with asthma (Camp Not-A-Wheeze). Nutrition education will emphasize an understanding of the dietary food pyramid, portions and moderation, as well as, increasing fruit and vegetable consumption in children. The importance of asthma management will be stressed in order to effectively participate in the encouraged sixty-minute daily exercise. The efficacy of the program will be evaluated through pre/post questionnaires targeting perceived benefits and barriers to exercise, social support scale, a 24-hour diet journal, an exercise contract, an action plan for asthma self-management (questionnaires), body mass index (BMI), and pulmonary function tests (PFT). The pre-questionnaires will be administered immediately before conducting the Nutrition and Exercise Education for Children with Asthma (NEECA) program, (T1) immediately after completing the NEECA program (T2) again at six months after returning home (T3), and during camp the following year (T4).
CHAPTER I: INTRODUCTION

Purpose

The purpose of this masters’ report is to present plans to implement and evaluate an evidence based program to improve eating patterns and physical activity among school-age children attending a summer camp for children with asthma (Camp Not-A-Wheeze). Information collected will be used to develop a program to educate and motivate asthma campers attending Camp-Not-A-Wheeze to achieve and maintain a healthy lifestyle. Children will be taught to improve eating patterns, maintain a safe and healthy body weight, and to manage asthma symptoms so the physical activity recommendations are possible. Nutrition education will emphasize an understanding of the dietary food pyramid, portions and moderation, as well as, introducing the five a day program to the children. The importance of asthma management will be stressed in order to effectively participate in the encouraged sixty-minute daily exercise.

Children with asthma are a population that requires understanding of the disease process, as well as, understanding self-management to ensure safe and effective therapy. This chapter presents an overview of the epidemiology of asthma, the definition of asthma, the pathophysiology of asthma, the clinical presentation of asthma, the pharmacological and non-pharmacological management of asthma.

Asthma

The following section evaluates the asthma disease process and asthma management strategies. The incidence of asthma is better understood through the examination of epidemiology in the United States. The Guidelines for the Diagnosis and
Management of Asthma is also reviewed (NIH, 2007). This section also includes descriptions on the pathophysiology of asthma, clinical presentation of asthma, as well as pharmacological and non-pharmacological management.

**Epidemiology of Asthma**

In 2004, the Center for Disease Control reported that 5.1 million school-aged children and adolescents had asthma (Center for Disease Control, 2007). Of those affected children and adolescents, 3.2 million reported having a severe asthma attack within the last year (CDC, 2007). Asthma is the leading chronic illness in children and adolescents in the United States and is the third leading cause of hospitalization (CDC, 2007). The CDC notes that within any classroom of thirty students, three of those students are suspected to have asthma (CDC, 2007). Asthma is also the leading cause of school absenteeism in the United States, with an estimated 12.8 million school days missed in 2004 (CDC, 2007). Statistics of the most affected populations are Puerto Ricans at 19.2%, Black, Non-Hispanic at 12.7%, and White, Non-Hispanic at 8.0% (CDC, 2007).

**Definition of Asthma**

Asthma is a complex disease with varied clinical presentations and many precipitating factors and triggers. Asthma is defined as “… a disorder characterized symptomatically by a cough, chest tightness, shortness of breath, and wheezing associated with limitation of airflow” (Fiebach, et al., 2007, pg. 896). Asthma is divided into four stages based on the frequency and severity of symptoms: 1) mild intermittent, 2)
mild persistent, 3) moderate persistent, and 4) severe persistent (Mengel & Schwiebert, 2005). The four stages of asthma are more clearly defined in the section titled Clinical Presentation of Asthma.

According to the Guidelines for Diagnosis and Management of Asthma, “asthma is a complex disorder characterized by variable and recurring symptoms, airflow obstruction, bronchial hyperresponsiveness, and an underlying inflammation” (National Institute of Health, 2007). “The interaction of these features determines the clinical manifestations and severity of asthma” (National Institute of Health, 2007). According to the National Institute of Health (NIH) guidelines “the development of asthma appears to involve the interplay between host factors (particularly genetics) and environmental exposures that occur at a crucial time in the development of the immune system” (National Institute of Health, 2007).

Pathophysiology of Asthma

Asthma primarily affects the bronchus through pathological changes in the smooth muscle of the bronchial tube including hyperplasia, excess mucus production and chronic inflammation (Kumar, Abbas, & Fausto, 2005). The reason asthma affects certain individuals are still unknown, however, understood etiologies of asthma are genetic predisposition, hypersensitive and hyperresponsiveness, immunologic, or remain undefined. Inflammation involves several cell types and numerous inflammatory mediators: eosinophils, mast cells, macrophages, T-cell lymphocytes, neutrophils, and epithelial cells (Sherwood, 2007).
After an allergen enters the airway the body reacts by releasing type 2 helper cells which secrete interleukins, promoting allergic inflammation, and stimulate B cells to produce IgE and other anti-bodies (Kumar, et al., 2005). Type 1 helper cells produce interferon and interleukin-2, which activates macrophages and cytotoxic t-cells eliminating viral infiltrates (Kumar, et al., 2005). Airway remodeling occurs once mast cells are triggered by IgE and begin to cause hypertrophy of the bronchial smooth muscle. Mast cells and eosinophils release mediators, which increase mucus production in the respiratory tract (Sherwood, 2007) (See Figure 1).

**Clinical Presentation of Asthma**

Regardless of the etiology, asthma often presents with chest tightness, dyspnea, cough, night awakenings, and wheezing (Mengel & Schwiebert, 2005). Variations of asthma include: extrinsic asthma, intrinsic asthma, occupational asthma, allergic bronchopulmonary aspergillosis, reactive airway dysfunction, exercise-induced asthma, triad asthma, and catastrophic asthma (Fiebach, 2007). Another associated symptom is a cough, which can be a variant of asthma, and if persistent with treatment, it may require further investigation into vocal cord dysfunction, a psychogenic or “habit cough”, or other structural abnormalities (Burns, Dunn, Brady, Starr, & Blosser, 2004). Structural abnormalities associated with the upper respiratory system may include tracheal or foreign body compression such as a tumor or an aortic ring (Burns, et al., 2004).

Extrinsic asthma is described as an asthmatic reaction to an allergen whereas; intrinsic asthma is an asthma attack with no clear association with specific allergens. Occupational asthma is an accidental exposure at work, which leads to cough, chest
tightness and wheezing. Allergic Bronchopulmonary Aspergillosis (ABPA) is asthma triggered by an allergy to non-invasive aspergillus, fumigatus, or other fungi, which is an uncommon disease and is difficult to treat (Fiebach, et al., 2007). Reactive airway dysfunction is a disorder, which follows an intense but short-term exposure to a toxic non-allergenic substance (Fiebach, et al., 2007). Exercise induced asthma is a bronchial spasm occurring in athletes who may or may not have been diagnosed with extrinsic asthma (Burns, et al., 2004). Another diagnosis is triad asthma, which is characterized by nasal polyps, and sensitivity to Aspirin, (Burns, et al., 2004). Catastrophic asthma is rapid deterioration of the bronchus, which may have fatal results (Fiebach, et al., 2007).

Asthma is defined into four stages based on severity of symptoms: 1) mild intermittent, 2) mild persistent, 3) moderate persistent, and 4) severe persistent. It is important to understand each stage, as well as, their associated signs and symptoms, because this can indicate poorly managed asthma. Identification of these exacerbations can help children with asthma understand their limitations and dangers when not properly managing their disease. In order to participate in the physical activities associated with Nutrition and Exercise Education for Children with Asthma (NEECA) it is important that asthma is well managed.

Mild intermittent is described as daytime asthma symptoms of less than twice per week, nighttime asthma symptoms less than twice per month, peak expiratory flow rate (PEFR) readings at least 80% of normal limits, and remains asymptomatic between episodes (Fiebach, et al., 2007). Mild persistent asthma is described as daytime symptoms of less than three times per week, and nighttime symptoms of less than three times per
month, and with a PEFR at least 80% of normal readings (Fiebach, et al., 2007). Moderate persistent asthma daytime symptoms are greater than twice per day, nighttime are symptoms of greater than one time per week, and PEFR of 60-80% of normal rate (Fiebach, et al., 2007). Lastly, severe persistent is continual day and night symptoms of PEFR of less than 60% of normal readings (Fiebach, et al., 2007).

**Pharmacological Management of Asthma**

There are eight classes of medication to consider with pharmacology interventions in the asthma population. Anti-leukotriene drugs are used with mild to moderate asthma with allergies, aspirin sensitivity, and exercise induced asthma (Fiebach, et al., 2007). Nasal anti-histamines compete with histamine or allergens for H-1 sites preventing sinusitis (Fiebach, et al., 2007). Inhaled non-steroidal anti-allergy drugs are used in preventing exercised induced asthma (Fiebach, et al., 2007). Inhaled short-acting beta agonists are used in mild asthma, acute attacks, and do have cardiovascular side effects. Levabuterol can be considered when patients are unable to tolerate cardiovascular side effects since it has less action on Beta-1 agonists (Fiebach, et al., 2007). Inhaled corticosteroids are an anti-inflammatory that is used in persistent asthma symptoms. Inhaled anti-cholinergic is beneficial when used in combination with inhaled Beta-2 adrenergic agonists in acute exacerbations (Fiebach, et al., 2007). Long-acting beta agonists are used in moderate to severe persistent asthma and have a slower onset and long duration of action (Fiebach, et al., 2007). Lastly, oral corticosteroids are used only in acute exacerbations when symptoms are not controlled by other prescribed interventions (Fiebach, et al., 2007).
Non-Pharmacological Management of Asthma

There are major components to consider with the non-pharmacological treatment of asthmatics. Management includes: monitoring lung function, understanding medication compliance and administration, making environmental changes, and avoiding triggers. A patient should be educated on a color-coded system for respiratory functioning when monitoring morning and evening peak flow readings (Burns, et al., 2004). Green zone readings should be greater than 80% of the patient’s best peak flow, yellow zone should be between 60-80% of best reading, and the red zone is less than 60% of best (Burns, et al., 2004). Understanding medication administration is important so patient is using a spacer so medication is disbursed properly and patient receives optimal amount of treatment (National Institute of Health, 2007). Environmental changes occur after asthma and allergens are identified (Mengel & Schwiebert, 2005).

Obesity in Children

Children with asthma, like children in general, are increasingly overweight and obese. This section focuses on the health problems of obesity in childhood as background information for the development of the NEECA program. The following presents an overview of the epidemiology of obesity in children, the definition of obesity in children, the pathophysiology of obesity in children, the clinical presentation of obesity in children, the pharmacological and non-pharmacological and management of obese children.

Epidemiology of Obesity in Children

The incidence of overweight and obese individuals is rapidly increasing in the United States population. According to the National Health and Nutrition Examination
Survey (NHANES) reveals that in 1988-1994 the prevalence of overweight 6 to 11 years old was 11.3% and in 12 to 19 years old was 10.5% (CDC, 2008). In 2002, it was seen that 9 million, approximately 16% of children and adolescents aged 6 to 17 years old were considered overweight. In 2004, these rates were seen to have increased to 18.8% in 6 to 11 year olds and 17.4% in 12 to 19 year olds (CDC, 2008) (FIGURE 2).

**Definition of Obesity in Children**

According to the Center for Disease Control (CDC), overweight and obesity are defined by a comparison of weight and height determining the person’s body mass index (BMI). According to the simple BMI calculations, below 18.5 is underweight, 18.5 to 24.9 is a healthy weight, 25 to 29.9 is overweight, and anything over 30 is considered obese (CDC, 2008). When applying this equation to children the CDC suggests using a standard ideal body weight growth chart is made specifically designed for either male or female. When height and weight are plotted on the chart the percentage of ideal body weight is indicative of desired weight, greater than 120% is overweight, 90-110% is normal, less than 80% is underweight (Burns, et al., 2004).

**Pharmacological Management of Obesity in Children**

There is no approved weight loss drug for children from the food and drug administration. Other considerations include monitoring for other co-morbidities associated with overweight children such as: hypertension, high cholesterol, impaired glucose tolerance, sleep apnea, and orthopedic problems (Burns, et al., 2004). According to Burns, et al., 2004, the primary goal of weight management in children is to normalize weight…recommendations for treating obesity center on slowing the rate of weight gain,
thereby allowing children to grow into their weight” (Burns, et al., 2004). The best way to control obesity in children is through non-pharmacological interventions.

**Non-Pharmacological Management of Obesity in Children**

Since the prevalence of overweight and obesity has increased so significantly in the past decade it is necessary to educate children on prevention through implementation of a health lifestyle. Implementing healthy eating habits requires a basic understanding of the food pyramid, recommended portions of food, and increasing the amount of fruits and vegetables consumed. Aside from healthy eating it is also necessary that children get at least sixty-minutes of exercise daily (CDC, 2008). Also, children should be encouraged to avoid sedentary lifestyles, which may include: playing excessive amounts of video or computer games or watching television (CDC, 2008).

**Conclusion**

Asthma is the leading chronic illness in school-aged children in the United States. Children with asthma need to be educated on their disease process as well as encouraged to have self-management of their asthma. There is also data to support a large finding of children with obesity in the United States. In 2004, nearly one fifth of the school-aged children were considered obese. The Center for Disease Control and Prevention has promoted that all children begin a healthy eating regimen and sixty-minutes of daily exercise. Children with asthma have the potential to be affected with obesity, if not already affected. Children with asthma need consideration for optimal management of their disease to incorporate the recommended lifestyle improvements.
CHAPTER II: REVIEW OF LITERATURE

The following section examines the implications of research pertaining to asthma education, asthma self-management, self-management of chronic disease, prevalence of obesity, obesity risk factors, and obesity prevention, all of which has been limited to children. Through evaluation of existing research it is possible to distinguish cross sectional areas between asthma and obesity that lack concentration and need further evaluation.

Children’s Asthma Self-Management Research

There have been many studies examining the incidence of asthma in children and adolescents and the efficacy of asthma education on the disease process and self-managing strategies. Most research that examined self-management of asthma related disease in children used the health promotion model to design and evaluate their research. This section presents important study results supporting the premise that asthma education leads to more effective self-management of asthma and significant reductions in disease exacerbation.

Ram, Robinson, Black & Picot (2005) conducted an investigation of the outcome of physical training for treatment of asthma among subjects eight years and older. The study was framed using the Health Promotions Model. The study participants were required to undertake whole body aerobic exercise for 20 to 30 minutes, 2 to 3 times per week for a minimum of four weeks. Exacerbations of symptoms were recorded in a daily diary card, and physiological measurements were conducted by a complete pulmonary function test (PFT). Research findings were significant for cardiopulmonary function
improvement without having an adverse effect on lung function (Ram, Robinson, Black, & Picot, 2005).

There are several studies that specifically address asthma self-management in children. Bhogal, Zemek, Ducharme, 2006, investigated the efficacy of written action plans (WAP) for asthma in children to determine if self-written plans resulted in a better patient outcome. The study reviewed four trials, three were random clinical trials and one was quasi-randomized trial. The researchers examined the influence of WAP on the patient outcome and whether or not all patients should receive a WAP (Bhogal, Zemek, Ducharme, 2006). The measurements included the severity of attacks and rate of emergent relief, chronic asthma control, and changes in PFTs. The evidence suggests that symptom-based WAP are superior to peak-flow WAP for preventing acute attacks (Bhogal, et al., 2006). Asthma management strategies such as these reduce emergency room visits as well as preventing acute attacks (Bhogal, S., Zemek, R., Ducharme, F.M., 2006).

A similar study by Toelle and Ram (2004), examined written individualized management plans for asthma. The study design was random clinical trials examining results in both children and adults. Measurements of efficacy of the WAPs were the noted peak flow usage and record, as well as, medication adjustments, and PFTs (Toelle, Ram, 2004). The results both studies showed that of self-reported questionnaires and forms of management, which include: a written action plan and the use of a peak flow meter and a record of peak flow readings were effective in reducing acute attacks.
Summary of Asthma Self-Management Research

Based on available research using identified methods acute asthma exacerbations can be prevented. The studies examined have evidence that the following methods can be preventative if implemented. The methods used include: written individualized management plans for asthma or written action plans (WAP), and completion of pulmonary function tests (PFT). Also, as evidence by one study, aerobic exercise showed a significant improvement in cardiopulmonary function with no negative effect on lung function or asthma. Based on evidence, written action plans, pulmonary function tests, and an increase in aerobic exercise have shown to have a positive influence on asthma self-management.

Obesity Research to Prevent and Treat Children

This section reviews research about interventions to prevent or treat obesity in children. Evaluation of existing obesity research identifies areas of strengths and weaknesses that can be applied to the NEECA program from optimal evidence based results. Due to the rapidly increasing prevalence of obesity in children there are several studies reflecting interventions for preventing and treating the growing disease.

Summerbell, et. al., (2005) examined interventions for treating obesity in children, used HPM frame and the influence of social support on the child’s success. The researchers examined the obesity in children through selected randomized clinical trials. A healthy-lifestyle was examined by the researchers, which included diet, increased physical activity, and social support. Implementations of the research included a healthy lifestyle intervention during a six-month duration and found that even without family
support there was still a reduction in the child’s BMI (Summerbell, Ashton, Campbell, Edmunds, Kelly, & Waters, 2005). The NEECA program examines the influence of social support on children’s outcomes, and this research indicates that children without adequate social support can still be positively affected.

A more recent study conducted by Summerbell, et al., (2007) examined interventions for preventing obesity in children, which include diet modifications and increase in physical activity. The review examined twenty-two studies, nineteen of which were school-based or pre-school based interventions, one was a community-based intervention, and two were family based interventions (Summerbell, et al., 2007). The study was conducted as randomized clinical trials with a minimum of twelve-week duration. The primary outcomes examined weight and height, percent body fat, Body Mass Index (BMI), and skin-fold thickness. Secondary outcomes examined activity levels, and dietary intake using diaries. The results of the study revealed a small but positive impact on the BMI status. The research also indicated that twelve weeks is not long enough for a significant change with small daily changes and should be conducted over a longer duration (Summerbell, et al., 2007). The NEECA program can use an evidence-based approach to extend the program past the one-week of camp to at least six months to evaluate a large positive change in the BMI.

**Summary of Obesity Research to Prevent and Treat Children**

Based on available research there is evidence-based interventions that can be used in children to promote a healthy weight. The studies examined a healthy diet modification and an increase in physical activity to either prevent or treat obesity. The measurements
used by the researches included: weight and height, percent of body fat, BMI, skin-fold thickness, and social support. Daily changes were seen to be affective in improving measurement scores and reducing incidence of obesity. Social support was identified as helpful but not necessary to achieve weight reduction goals.

Overweight and Obesity in Children with Asthma

There is little research that examines the interaction between children with co-morbidities of asthma and being overweight or obese. Asthma is the leading chronic illness affecting 5.1 million school-aged children and obesity affects 9 million children age 6 to 17 years old. It is not understood how many children suffer from asthma and obesity, however, based on evidence of obesity incidence in the United States all children should be educated on good nutrition and increases in physical activity. Children with asthma require special consideration and advanced education in disease management. Asthma education should focus on prevention of asthma attacks and intervention methods to maintain desired asthma self-management.

One study preformed by NHANES III, examined the negative effect that obesity had on asthma management, the relationship between BMI, exercise, diet, and self-reported asthma symptoms. Data analysis revealed that there was a positive correlation between BMI and increased physical activity and dietary changes. It was identified that the higher the BMI score, the higher the incidence of self-reported recurrent wheezing and asthma attacks (Romieu, Mannino, Redd, McGeehin, 2004).
Summary of Overweight and Obesity in Children with Asthma

Based on the limited research it was identified that asthma self-management and prevention is necessary to perform the recommended increase in physical activity. Evidence from one study also implicated that an undesirable BMI from poor nutrition and lack of exercise can actually lead to worse management of asthma leading resulting in chronic attacks and periodic wheezing. It can be presumed that proper nutrition, an increase in physical activity, and asthma self-management can lead to prevention of attacks.

Camp Program Research

A search was completed on CINAHL in November 2007 using varied combinations of the key words: children, camp, health promotion, asthma, obesity, exercise, and nutrition. There has been no published research about obesity interventions with children with asthma. However, it is important to consider that asthma is the leading chronic illness of school-aged children in the United States and almost 20% of school-aged children are suffering from obesity (CDC, 2008). More research needs to be done to evaluate the incidence of the co-morbidities of asthma and obesity. Furthermore, camp has not been examined as a site to educate on prevention of obesity through nutrition and exercise promotion.

Summary of Camp Program Research

There is no evidence to support the significance and possible efficacy of implementing such a program in a camp setting and further research needs to be done. However, according to Pender’s Health Promotion Model, social support, similar to the
support received at camp, is important in order to establish working relationships that will encourage and further one another with the new lifestyle modifications. It is also possible for the American Lung Association to follow up with the children with asthma who have attended camp to identify if there were any improvements in their asthma self-management and a reduction in their acute episodes.

**NEECA Conceptual Framework**

Pender’s Health Promotion Model (HPM) was selected as the best fit for framing NEECA, using selected key concepts from her model. Pender’s (1982) HPM is a well-established model with a long history of use in studies about health promotion behaviors in various populations. The Health Promotion Model draws from expectancy-value theory and the social-cognitive theory (McEwen & Wills, 2007) and integrates nursing and behavioral science perspectives (McEwen & Wills, 2007). Pender believes that, “a person’s perception of the threat of a health problem and the appraisal of recommended behaviors for preventing and managing problems” motivates that person to make a change (Health Promoting Agency, 2007).

**Health Promotion Model**

The Health Promotion Model (HPM) is a conceptual framework integrating nursing and behavioral science perspectives on factors that influence health behaviors (McEwen, & Wills, 2007). Major concepts and ideas related to HPM that are applicable to this program are individual characteristics and experiences, self-efficacy, activity-related affect, benefits of actions, and health promoting behavior (McEwen, & Wills, 2007). A review of literature shows that Pender’s HPM has been used effectively used in
educating patients on self-management of their disease as well as preventing obesity in children. HPM is the ideal framework to model the program for evaluation of applicability and efficacy in the asthmatic school-aged population.

Health Promotion Model Research in Children

A CINAHL search conducted in February 2008 cross-referencing the terms 1) Pender’s Health Promotion Model and 2) Children produced 22 results. Among those results were three relevant studies. The first study conducted by Barrett, Dunkin, and Shelton (2001) was an Examination of the NHANES data set: pets, wheezing, and allergy symptoms relevance and significance in children. The study examined data from over 5,000 children with asthma and allergies aged 5 to 16 years old using the HPM as a guideline to facilitate health promotion practices. The second study conducted by Murphy et al., (2007) applied HPM to identify Parental perceptions of the schools’ role in addressing childhood obesity. The third study by Robbins, Gretebeck, Kazanis, and Pender (2006) used HPM to examine Girls on the Move program to increase physical activity participation.

Health Promotion Model Key Concepts

A key concept in the HPM concepts is the expression of self-efficacy, which is the belief that a person has the ability to change their own behaviors, and changes in personal health practices and choices can positively influence health (McEwen & Wills, 2007). Other key concepts for the NEECA are perceived susceptibility, perceived severity, perceived benefits of actions, lastly, cues to action (Pender, 2007) (See Table 1). In Pender’s HPM model, one objective for health promotion with children is increasing
self-efficacy for targeted behaviors through age-appropriate teaching and learning activities and practicing skills (Pender, 2007).

**Health Promotion Model Key Concepts and NEECA Measurements**

The proposed NEECA interventions are based on Nola Pender’s Health Promotion Model and the methods used in effective research. The primary intervention for sufficient efficacy and management are self-reported questionnaires. Other interventions include a healthy lifestyle modification, which include nutrition education and exercise implementation. Nutrition education will include information on understanding what comprises the food pyramid, recommended portions, and increasing intake of fruits and vegetables high in fiber. The recommended exercise consists of decreasing sedentary activities and implementing sixty or more minutes of cardiovascular aerobics each day.

**TABLE 1: HPM Key Concepts versus NEECA**

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<tr>
<th>HPM Key Concepts</th>
<th>NEECA Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Characteristics and Experiences</td>
<td>24 hour diet recall, Acute Asthma Exacerbations, Social Support Scale</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>Asthma Action Plan (AAP)  Exercise Self-Efficacy Questionnaire</td>
</tr>
<tr>
<td>Activity Related Effect</td>
<td>Body Mass Index  Pulmonary Function Tests</td>
</tr>
<tr>
<td>Benefits of Actions</td>
<td>Perceived Benefits/Barriers Questionnaires</td>
</tr>
<tr>
<td>Barrier of Actions</td>
<td></td>
</tr>
<tr>
<td>Health Promoting Behaviors</td>
<td>60 Minutes of Daily Exercise</td>
</tr>
</tbody>
</table>

**Camp-Not-A-Wheeze**

American Lung Association of Arizona and Friendly Pines camp grounds in Prescott Valley, Arizona, host an annual camp for asthmatic children and adolescents.
between the ages of seven and fourteen years old. Camp-Not-A-Wheeze is supported by a large staff of medical volunteers. The medical volunteers include nurses, respiratory therapists, pharmacists, and doctors. Two to three medical volunteers are stationed in each cabin and are available twenty-four hours a day for camper assistance and asthma education. The campers are divided into cabin groups based on age and sex, for example nine-year-old girls will share a cabin. Camp activities consist of various physical activities that children with asthma may typically avoid. The goal of camp is to educate campers to manage their asthma, so they are able to participate in any activity and lead a life without restrictions. Camp-Not-A-Wheeze is an ideal situation to educate children with asthma on the effect of poor diet and lack of exercise on their bodies.

Children’s Developmental Stages

In order to identify a target population, a few factors must be considered including: biological, psychological, and social characteristics of the children. The biological factors of the children at camp are similar in that they all share a diagnosis of asthma. However, not all children attending camp are considered to be overweight. Other variations in biological factors are the age, sex, and severity of disease in the children. The weight, sex, and severity of disease of the children will not considered for inclusion criteria. The campers are aged from seven to fourteen-years old.

Erickson’s Psychosocial Stages

To define which age group will be used, it is necessary to consider the psychological factors are exhibited. When considering education in any population, it is best to evaluate the developmental stage and cognitive abilities. There are two
psychosocial stages represented at camp, 6 to 12 years old, *Industry versus Inferiority* (Boynton, et al., 2003). Also represented at camp is early adolescence to middle adolescence years old, 11 to 14 years old, *Identity versus role confusion* (Boynton, et al., 2003). Since the program is thought to be preventative in nature and strives to create healthy lifestyles, it will target school-aged children. Also, *Industry versus Inferiority* psychosocial stage comprises a more captivated audience ready to learn from adult and role model figures.

*Piaget’s Developmental Stages*

Since there is an overlapping of definitions of groups it is necessary to also consider their cognitive development. According to Jean Piaget’s philosophy there are four stages of development, three of which are represented at camp: pre-operational thinking are ages 2 to 7 years old, concrete operational which are ages 7 to 11 years old, and formal operational, 11 years and older (Burns, et al., 2004). Since pre-operational thinkers often have an inability to use language as an expression and are egocentric thinkers, 7-year-old campers will be eliminated from the program (Burns, et al., 2003). After this evaluation developmental stage and cognitive abilities, campers participating in the program will be aged 8 to 12 years old.

*Socioeconomic Considerations*

Lastly, social factors need to be considered as they have an influence on the overall outcome of the children as individuals as well as their ability to find supportive role models. The camp does offer scholarships to children in need of financial assistance. Since camp is comprised of children from different races, heritage, and economic
standings it is not helpful to define the target group any further by these factors. However, information concerning these topics will be collected and kept for future evaluation.

Summary of NEECA Structure

Based on pertinent research Pender’s Health Promotion Model is used as the conceptual framework for the NEECA program. The American Lung Association and Camp-Not-A-Wheeze will host the NEECA program during their one week annual camp. The American Lung Association may identify improvements in asthma management among children who have previously attended camp to identify camp as a good site for health promotion activities. Based on Erickson Psychosocial Development Stages and Piaget’s Developmental Stages campers aged 8 to 12 years old will be participating in the NEECA program.
CHAPTER III: PLAN FOR IMPLEMENTING AND EVALUATING NEECA

The purpose of the Nutritional and Exercise Education of Children with Asthma (NEECA) program is to increase health-promoting behaviors (eating patterns and physical activity) among school-age children attending a summer camp for children with asthma (Camp Not-A-Wheeze). The purpose of the project is to implement and evaluate the effectiveness of the evidence based program NEECA. Nutrition education will emphasize an understanding of the dietary food pyramid, portions and moderation, as well as, in increasing fruit and vegetable intake. The importance of asthma management will be stressed in order to effectively participate in the recommended sixty-minutes of daily exercise.

This chapter first presents an overview of Pender’s Health Promotion Model (McEwen, & Wills, 2007) which provides the conceptual framework for the new camp-based program, Nutritional and Exercise Education of Children with Asthma (NEECA). The rational for tailoring NEECA for children age 8 to 12 years old is presented in terms of two developmental theories of Piaget (Burns, et al., 2004) and Erickson (Boynton, et al., 2004), along with other factors relevant to planning the program. The NEECA program is described in detail with respect to the information presented, the learning activities, and the class schedule. Finally, the evaluation plan is presented as a means of assessing the effectiveness of NEECA in achieving the desired outcomes.

NEECA Student Population

Health promotion programs are most effective when they are tailored to the relevant characteristics of the target group. The inclusion criterion for NEECA
participants is based on the theories of cognitive and psychosocial developmental stages of children with asthma. All participants must have a diagnosis of asthma. However, NEECA allows for tailoring individual action plans for health behavior change to the weight, sex, and severity of the asthma for each NEECA participant.

The boys and girls who will attend Camp-Not-A-Wheeze camp range in age from 7 to 14 years of age and have been diagnosed with moderate to severe asthma. This wide age range encompasses different cognitive (Piaget) and developmental (Erickson) stages of development, so that a program that would be appropriate for the youngest ages would not be appropriate for the older campers and vice versa.

**NEECA Developmental Stage Rationale**

There are two different psychosocial groups represented at camp as well as two different developmental stages. The idea of NEECA is to educate the maximum number of children with consistent material. Consistency is important so the instructors teach the same lecture at all sessions and the questionnaires can be completed at the following year at camp. There were three age groups that were not included in NEECA, 7 year olds, 13 year olds, and 14 year olds. The 7 year olds were excluded for three reasons, 1) they may not have achieved formal operations 2) this is their first camp away from their parents and too much information may be overwhelming and 3) camp time schedule constraints. The 13 and 14 year olds were excluded because they are no longer school-aged children and the NEECA program is considering a preventative program and therefore focuses on the younger population represented at camp.
Economic and Cultural Considerations

Pender’s model addresses diversity in health beliefs across ethnic groups and acknowledges the relevance of economic status and resources in health promoting behaviors, even in children (McEwen, & Wills, 2007). There are provisions at camp to encourage children from various ethnic, racial, and economic backgrounds to attend. For example, there are scholarships available for children in need of financial assistance.

There are diverse ethnic and cultural groups represented at camp, which include: Hispanic, Chinese, African American, Native American, and Euro American. Campers may also represent families with different levels of income, which is kept confidential from other campers, medical staff, and instructors. Ethnic differences may influence diets, as well as, liked food, so suggestions should include culturally appropriate food choices.

NEECA Program Class Schedule

This following section explains in detail the class schedule and timing, classroom structure, and the class size. This section also describes instructors education schedule through the American Lung Association monthly meetings prior to camp. The instructor’s expectations and NEECA manual are explained.

Class Schedule

The NEECA program can be conducted over 6 days of camp, with each session lasting only 35 minutes for a total of 210 minutes of in-class time. The teaching-learning methods are designed to enhance children’s self-efficacy through 1) providing the information and skills needed for targeted health behaviors 2) discussion of perceived
barriers and benefits to improved health behaviors and ways to overcome barriers and 3) social support from peers and from other role models.

Classes will be conducted in cabin groups, which are divided by age and sex. Each cabin has a range from 8 to 12 campers per group. There are a total of ten cabin groups that will be included in the NEECA program. Therefore, the class groups will be all boys or all girls, of similar ages for a total of approximately 80 to 120 campers.

An instructor manual will be drafted to include a listing of materials, content, teaching learning activities, and amount of time for each activity. The instructors will be expected to participate in the American Lung Association’s (ALA) camp planning committee, which meets monthly one year prior to camp. Instructors will participate in the ALA educational subcommittee and will be trained to teach NEECA in the meetings prior to attending camp.

Nutrition Intervention and Management

The NEECA nutrition intervention and management is explained in the following section. The information that will be given in the NEECA classroom includes education on the food pyramid, portion control, and an increase in fruits and vegetables. The following section also explains the measurement tools used in NEECA to evaluate the nutrition intervention.

Nutrition Information and Skills Practice

NEECA emphasizes an understanding of the dietary food pyramid, portions and moderation, and the need to increase fruits and vegetables. According to the Center for Disease Control (CDC) there are several programs in place that promote healthy eating
based on the food pyramid, an increase in fruits and vegetables, and an increase in daily exercise. The CDC has partnered with many not-for-profit organizations to develop a Better Health initiative in March 2007 based on the *Dietary Guidelines for Americans* (CDC, 2008). The traditional food pyramid has been modified from its original “one size fits all approach” and is now especially developed for children based on age, sex, and activity level (See Table 2).

The United States Department of Agriculture (USDA) designed the *My Pyramid* program to educate Americans about proper individualized nutrition and the importance of getting food from all areas of the food pyramid, with the exception of sugars, oils, and fats (USDA, 2008) (See Appendix E). There are three levels of lessons provided from the USDA and the My Pyramid program, Level 1 is designed for grades 1 and 2, Level 2 is designed for grades 3 and 4, and Level 3 is designed for grades 5 and 6. Each Level has three lesson plans each accompanied by an activity or quiz to ensure the children understood the covered material. The lessons will be given to the instructors during their meetings prior to camp in order to prepare to teach the information (See Appendix E).

Another program derived from the *Dietary Guidelines for Americans* is the National Fruit and Vegetables for a Better Health Initiative. The *Fruit and Veggies More Matters* initiative along with the National Council of Fruit and Vegetable Nutrition Coordinators, formerly 5-A-Day Program, have designed a program to educate what is the daily recommended amount of fruits and vegetables (CDC, 2008).

Practicing the skills for healthy eating include completing a 24-hour diet recall, which will be completed the first day of camp (See Appendix E). It is necessary to
complete the recall prior to the intake of camp provided food to get an accurate recording of the average home diet. During the 24-hour diet recall, NEECA students will be encouraged to report all food consumption: breakfast, lunch, dinner, snacks, drinks, and skipped meals. Skills in overcoming barriers to healthy eating include an understanding of what comprises a healthy meal and a healthy portion. Another concern may be the ability of children to choose their own meals since either parents or the school cafeteria does their food preparation. This concern should be addressed by emphasizing the importance of moderation, as well as, the low necessity for fats and oils, usually found in condiments, additional seasonings, and desserts.

TABLE 2: Daily Dietary Needs Based on Sex and Age

<table>
<thead>
<tr>
<th>Age Range (years old) and Sex (M=male, F=female)</th>
<th>Grains (ounces/day)</th>
<th>Vegetables (cups/day)</th>
<th>Fruits (cups/day)</th>
<th>Milk &amp; Calcium rich foods (cups/day)</th>
<th>Meats, Beans, Fish, Nuts (ounces/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 to 8, MF</td>
<td>4 to 5 ounces</td>
<td>1 ½ cups</td>
<td>1 to 1 ½ cups</td>
<td>2 cups</td>
<td>3 to 4 ounces</td>
</tr>
<tr>
<td>9 to 13, M</td>
<td>6 ounces</td>
<td>2 ½ cups</td>
<td>1 ½ cups</td>
<td>3 cups</td>
<td>5 ounces</td>
</tr>
<tr>
<td>9 to 13, F</td>
<td>5 ounces</td>
<td>2 cups</td>
<td>1 ½ cups</td>
<td>3 cups</td>
<td>5 ounces</td>
</tr>
</tbody>
</table>

(60 Minutes of daily exercise assumed)
*Information collected and adapted from Kids Health (2008) website

Physical Activity Intervention and Education

The following section explains the recommended physical activity in school-aged children according to the Center for Disease Control and Prevention. This section also examines the necessity for strong asthma self-management in order to adequately participate in the suggested activities and the NEECA program.
Physical Activity Information and Skills Practice

The importance of asthma management will be stressed in order to effectively participate in the recommended sixty-minutes of daily exercise (CDC, 2007). Exercise is an important part of daily health, as well as, determining nutritional need. It is recommended for school age children to participate in one hour or more of physical exercise daily (Kids Health, 2008). Exercise can be broken into increments of 15 minutes or more, which should be more easily tolerated (Kids Health, 2008) (See Appendix F).

Asthma Management and Education Implementation

Although asthma education and disease management is taught concurrently at camp during a different classroom period it is reinforced in the NEECA program. The exercise education portion of NEECA recalls disease management and past experiences to create a sense of social support, as well as, shared and taught ideas for avoiding asthma exacerbations and interference with desired and recommended daily activities.

NEECA Asthma Management

It is important for both the NEECA instructors and the students to understand the importance of asthma management for not only personal health and life satisfaction but also the ability to participate in the NEECA program. Asthma management plans that will be reviewed with the students include: 1) Asthma Action Plan (AAP) and 2) Peak flow completion and review. The AAP is American Lung Association’s version of a written action plan (WAP), and are identical tools with different names. The asthma action plan ideally should be completed by the child, the parents, and with the help of the primary care provider of the child prior to attending camp. However, it is not guaranteed that this
important documentation will be completed and brought with the camper as prescribed, therefore, the asthma educators at Camp-Not-A-Wheeze will complete additional Action Plans as necessary. The Action Plan may be used for review of asthma management, however, is not the responsibility of the NEECA instructor.

All campers are supplied with peak flow meters from the ALA in order to complete a peak flow reading in the morning and the evening, at 7 am and 8 pm. The peak flow meter is a tool that demonstrates when the airway is experiencing inflammation and therefore may have ill managed asthma. The peak flow meter is a device that is divided into three different colors which aids to guide the camper to know when they are in danger for an acute asthma attack. The peak flow measurements can be reported in NEECA to demonstrate how asthma management can reflect the camper’s ability to perform well in the program.

**NEECA Environmental Factors**

Pender’s HPM includes consideration of the physical environment, including the classroom or outdoor environment e.g. safety concerns. The classroom setting will be in a log cabin with tables and chairs to accommodate the cabin groups. The cabin has electricity and media equipment that includes a television with a video player, a power point projector, and access to a copy machine. This setting allows for small groups to engage in discussions and allows use of video visuals or power point presentations for selected portions of the NEECA curriculum. It is important to educate the NEECA students to be aware of safety concerns in their immediate setting which may include: open areas of water, uneven territory, dangerous animals, possible triggers, the proximity
of a known adult, and stranger danger. It is also necessary to remind students not to push
themselves if they do not feel well, to take their medication as prescribed, and to
emphasize fluid hydration.

NEECA Evaluation Methods

The NEECA evaluation will include both formative and outcome evaluation
components. Formative evaluation will include brief interviews with both the children
participants and the instructors during and at the conclusion of the NEECA program. The
formative evaluation interview topics will include inquiries pertaining to satisfaction with
the program material, program timeline, and recommendations for improvement and
report of any unexpected events that may have affected class activities.

Evaluation of outcomes will include data collection at time points: immediately
before beginning NEECA (T1), immediately after completing the NEECA program (T2)
again at six months after returning home (T3), and during camp the following year (T4).
The measures are presented in Table 3.

NEECA Measurement Tools

There are six different areas that are being measured in the NEECA program.
These measures include: self-efficacy, benefits and barriers to exercise, social support,
nutrition, exercise, and asthma. The following section defines each measurement and
explains the scoring tools. All of the information is presented in Table 3.

NEECA Self-Efficacy Measurement

Self-efficacy is the belief that a person has the ability to change their own
behaviors, and changes in personal health practices and choices can positively influence
health (McEwen and Wills, 2007). Pender’s Self-Efficacy measurement tool is an eight-part questionnaire that examines the individual’s willingness and ability to exercise despite life obstacles (Pender, 2007) (See Appendix B). Pender’s Self-Efficacy tool defines exercise for school-aged children as breathing fast, feeling sweaty, and getting your heart rate up (Pender, 2007). There are five possible responses used in the questionnaire and each are assigned a numerical value: Not at all true (1), Not very true (2), In-between (3), Sort of true (4), and Very true (5). All responses by the individual should be added and then divided by the total number of answered questions to give the mean response (Pender, 2007) (See Appendix B).

**NEECA Benefits and Barriers Measurement**

The Benefits and Barriers measurement is used to identify an individual’s perception of benefits and barriers to exercise and is used as an indication of their likeliness to exercise (Pender, 2007) (See Appendix C). Exercise is again defined as being active enough to increase your breathing, get sweaty, and increase your heart rate (Pender, 2007).

The Benefits measurement is a nine-part questionnaire. This questionnaire examines several benefits to exercising such as: looking and feeling better, making friends, and feeling happier (Pender, 2007). The questionnaire has five responses, which are assigned a numerical value. The possible responses are: Not at all true (1), Not very true (2), In-between (3), Sort of true (4), and Very true (5). The responses should be added up and divided by the total number of questions asked to derive the mean answer for the individual (Pender, 2007) (See Appendix C).
The Barriers measurement is a ten-part questionnaire (Pender, 2007). This questionnaire examines several barriers to an individual’s ability to exercise such as: not having enough time, not having a good place, having too much homework, not having the right equipment, and exercising alone (Pender, 2007). The possible responses are: not at all true (1), not very true (2), in-between (3), sort of true (4), and very true (5). The responses should be added up and divided by the total number of questions asked to derive the mean answer for the individual (Pender, 2007) (See Appendix C).

**NEECA Social Support Measurement**

The Social Support measurement is the individual’s perception of the support they receive from their family and friends to exercise. The measurement also examines the opinion of the family member and friend of the individual’s desire to exercise (Pender, 2007). There are two sections of this questionnaire.

The first section is a seven-part questionnaire that identifies the support received from mother, father, and brother or sister. The questions include: take me to play sports, exercise with me, encourage me to exercise or play hard, plan family sport activities, praise me for exercising, and complain about me exercising (Pender, 2007). There are three responses, which are assigned a numerical value: Never (1), Sometimes (2), and Often (3). If any response is left blank or the individual does not know the value of the response is zero. All responses should be added together and divided by the total number of questions to give a mean response (Pender, 2007) (See Appendix D).

The second section is a five-part questionnaire, which identifies the support received from friends. The questions are: play sports with me, exercise with me,
encourage me, praise me for exercising, or complain about me exercising. Again, there are three possible responses, which are given a numerical value: Never (1), Sometimes (2), and Often (3). If a response is left blank or the individual does not know then the value of the response is zero. The responses should be added together and divided by the total number of questions to find the mean response (Pender, 2007) (See Appendix D).

**NEECA Nutrition Measurement**

The nutrition measurement is a large part of the NEECA program education. The values and responses to these measurements identify the individual’s ability to learn and grow from the education. The three methods used in the nutrition measurement include: Body Mass Index (BMI) and Percentile Graph, 24-Hour Diet Recall, and My Pyramid Quiz.

The Body Mass Index (BMI) is a measurement of the individuals weight in comparison to their height. To calculate BMI weight must be converted into kilograms and the height into meters, therefore, BMI is the total of kilograms divided by meters squared (Burns, et al., 2004). Once the BMI has been found it must be plotted on a growth and development chart to identify the individual’s percentile. Since school-aged children are still growing, their BMI must be plotted on a percentile graph to identify overweight and obesity. Plotting the individual’s BMI on a graph also helps to quickly identify a change in percentile and whether or not the individual is maintaining a healthy weight (Burns, et al., 2004) (See Appendix E). This will be done at the beginning of NEECA (T1), at the six month follow up (T3), and when returning to camp (T4).
The 24-Hour Diet Recall is given to the children on the first day of the NEECA program to identify what comprises an average day of food and drink consumption at home. The 24-Hour Diet Recall is a form with the headings: Food, listed individually, Serving Size, Time or Meal, and Where, home or school. This should be completed as accurately as possible to identify any areas of concern. This form will be completed at the beginning of the NEECA (T1), at the six month follow up (T3), and when returning to camp (T4) (See Appendix E).

The My Pyramid is sponsored by the United States Department of Agriculture and is a series of age specific lessons plans designed to educate children on food groups, portions and moderation, and the importance of fruits and vegetables (USDA, 2008). The MyPyramid Lesson plans have an age appropriate activity at the end of each section. The activities include the Fill-In the Pyramid, Food Math, and Fruit and Vegetable Diary. The fill-in the pyramid quiz identifies the student’s ability to identify food groups and daily desired quantities (USDA, 2008). The Food Math is questionnaire, measures the students understanding of food groups as well as recommended portions (USDA, 2008). The Fruit and Vegetable Diary evaluates the children’s understanding of how to identify their weekly intake of fruit and vegetables (USDA, 2008). Also, the My Pyramid worksheet is tool that students are given to help better understand their daily intake and encourage them to make better nutritional choices (USDA, 2008) (See Appendix E).

**NEECA Exercise Measurement**

The exercise measurement tools include: an exercise preference questionnaire and an exercise contract. The exercise preference profile is a nine-part questionnaire that
examines the student’s preference between two activities, one activity is more sedentary and one is more active. The student is given one point for every sedentary answer and the higher the score the more likely a sedentary active will be the preference to a more active option (Pender, 2007) (See Appendix F).

The Exercise Contract is a signed agreement form from the student that he or she will exercise for a determined amount of minutes per day. The contract also lists several activities that are considered exercise, which allows the students to pick their favorites as well as give them additional ideas. The fulfillment of the contract is self-reported by the student and is considered to be successful if the student exercises at least fifty percent of the contracted time (See Appendix F).

**NEECA Asthma Measurement**

The NEECA program reinforces the importance of asthma management. The asthma tools used include the Asthma Action Plan (AAP), which helps children to identify their symptoms and be able to manage their asthma before having an acute exacerbation. A peak flow meter graph is also used to evaluate the morning and evening lung function of the children. Each child is given a pulmonary function test tool to continue to monitor their levels once they return home (See Appendix A).

The children will report any acute exacerbations, which lead to visits to their primary care provider, emergency room, or hospitalizations within the last year. The children will also be expected to report their average use of their rescue inhaler in one month. These reports will help to identify if the child’s asthma is well managed and if exercise was even possible. Identifying the child’s ability to participate in the
recommended and contracted physical activities will help give an accurate estimate of the child’s involvement and understanding of the NEECA program objectives.

TABLE 3: NEECA Measurement Tools

<table>
<thead>
<tr>
<th>HPM Concept</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Efficacy</td>
<td>Self Efficacy Questionnaire (Pender, 2007)</td>
</tr>
<tr>
<td>Benefits and Barriers</td>
<td>Benefits and Barriers Questionnaires (Pender, 2007)</td>
</tr>
<tr>
<td>Social Support</td>
<td>Social Support Questionnaires (Pender, 2007)</td>
</tr>
<tr>
<td>Nutrition</td>
<td>24-hour Diet Recall&lt;br&gt;Body Mass Index (BMI)&lt;br&gt;BMI Percentile Graph&lt;br&gt;MyPyramid Activities (USDA, 2008)</td>
</tr>
<tr>
<td>Exercise</td>
<td>Self-report of fulfilled Exercise Contract&lt;br&gt;More than 50% participation fulfillment (per student) considered an improvement and successful</td>
</tr>
<tr>
<td>Asthma Management</td>
<td>Number of visits for acute exacerbations to Primary Care Provider, Emergency Room and/ or Hospitalizations during last 12 months.&lt;br&gt;Average use of Rescue Inhaler during a one month time period</td>
</tr>
</tbody>
</table>

Data Collection

At times 1 and 2, the instructor will complete the appropriate data collection. The instructor will administer the questionnaires in person, take the physical measurements, and collect self-reported information. At time 3, an ALA volunteer will contact children by telephone, however if they children have extenuating circumstances they may be contacted by mail. Data collected at time 3 will include: 1) 24-hour diet recall 2) BMI, with percentile graph 3) Amount of daily exercise reported 4) average peak flow readings 5) acute asthma exacerbations and lastly 6) use of rescue inhaler. At time 4, the instructor
will collect all measurement information on the first day of camp the following to assess the long-term changes.

Data Analysis

The information collected at all four times will be reviewed to show signs of an improved response to questionnaires, asthma management, improved eating patterns, and increase in physical activity. The purpose of NEECA was to develop a program that would improve eating patterns, increase physical activity, and encourage asthma self-management. The information collected at subsequent times after camp (T2, T3, and T4) will be analyzed for improvement in eating patterns (24-Hour Diet Recall), improvement or maintenance in weight (BMI Percentile Graph), increase in physical activity (Exercise Contract), and asthma management (AAP, Peak Flow Recordings) Asthma management will also be analyzed through reported acute exacerbations as identified through approximate uses of emergency relief inhaler, visits to the primary care, emergency room visits. Secondary findings will evaluate an influence on improvement from responses to questionnaires. Evaluation of this information may help to identify why some children meet there stated objectives and why others did not.

NEECA Curriculum

The NEECA program has a 6-day class schedule in order to convey all materials. The first day is used to collect all initial questionnaires and measurements (T1). The final day of the NEECA curriculum, day 6, is used to participate in an outdoor activity and to gather all final questionnaires after the completion of the program (T2). The activities can
be slightly modified if necessary dependant on the instructors preference and additional available resources or time.

Schedule of Lectures

Day 1 of instruction should include introductions. For example, suggest that the camper state their name, where they are from, and their favorite activity. Introductions should be followed by all first day questionnaires. If possible, pre-test data collection should be conducted prior to attending the class, which would be modified to a 5-day program. However, the structure of Camp-Not-A-Wheeze only accommodates that the first day of class be used to be pre-test the students.

The benefits and barriers to exercise questionnaires should be completed as a class to make the questions explicit as possible. Individual surveys will include a record of a body mass index, which shall be determined confidentially for privacy. Concurrently in a different class lead by the asthma educators will be completing Asthma Action Plans with the children, as well as, pulmonary function tests as determined by peak flow measurements. The campers will keep this information for review later in the week.

Day 2 will be a lesson on MyPyramid, as information is provided through the USDA’s power point presentation on MyPyramid. Activities include: identifying to which food group certain foods belong and the MyPyramid Worksheet. If bringing in real food to complete the lecture, it is important to identify food allergies and avoid the introduction and danger of that allergen.

Day 3 will be a review of the previous day. Since Friendly Pines Camp grounds provide USDA recommended meals for all campers, it will be easy to discuss what
foods they had on Day 2 that fit into their MyPyramid Worksheet. Day 3 is also a day to discuss the necessities of fruit and vegetables. Children can be given challenges to have food from every color every day. Have the children list the following colors on a sheet of paper, red, green, yellow, orange, and purple. After listing the colors the students need to list as many fruits and veggies that they can think of in each color category. The children can then share all of their answers, and all children will be rewarded for participation.

Day 4 is a discussion about exercise and asthma management. Today the educator needs to facilitate a discussion with the children about what sports they like to do or watch, what sports they may be afraid to try, how they feel their asthma play a role, how they feel their diet plays a role, and how they feel their family plays a role. This dialogue should also be accompanied by finishing the social support scale. The children need to be given homework to think about what exercise challenges they want to take on in the future. It is important to hold this lesson for later in the week, as the campers will be comfortable with one another and with the educator.

Day 5 should start with a five to ten minute group walk near the area of the classroom. Today the children will be asked to complete an exercise contract. The children will also discuss the Asthma Action Plans, their peak flow readings while at camp, and, any visits to the emergency room or hospital in the last year. This information will be saved to reevaluate the children in six months and a year. The children should break into groups of two and share with each other their exercise plan. After the children have shared with one another they will present each other’s information to the rest of the group. The
rest of the class will be wrap up questions from the week as well as a vote for what type of outdoor activity they want to do the next day.

Day 6 will be a fun day for children to complete their voted on outdoor activity as well as time for the educator to gather and organize information. This is also a time for student and teacher interviews to be completed. All information is summarized in Table 4.

<table>
<thead>
<tr>
<th>Day</th>
<th>Topic</th>
<th>Activity</th>
<th>Time (Minutes)</th>
<th>Method</th>
</tr>
</thead>
</table>
| 1   | Introduction     | 1) Introductions  
2) Questionnaires, Physical Measurements                                  | 5/30           | 1) Include favorite activity 
2) Measurements for Time 1 |
| 2   | Nutrition        | 1) MyPyramid Lesson  
2) Food Identifications  
3) MyPyramid Worksheet                                                      | 20/5/10        | 1) MyPyramid Lesson 
2) Give examples of food and identify its group 
3) Worksheet |
| 3   | Nutrition        | 1) Review MyPyramid  
2) Fruits and Veggies  
3) Bonus Time                                                               | 15/15/5        | 1) Review Day 2 food 
2) Game to identify as many fruits and veggies |
| 4   | Asthma Management| 1) Asthma Action Plan  
2) Peak Flow personal best  
3) Self Report Collection                                                      | 15/15          | 1) Review AAP 
2) Peak Flow recordings 
3) PCP/ER/Hospital Visit Rescue inhaler use data |
| 5   | Exercise         | 1) Walk around arena  
2) Exercise Contract  
3) EAP Share Time                                                          | 5/15/15        | 1) Warm Up 
2) Exercise Contract Worksheet 
3) Break into partners and share information |
| 6   | Fun Day!         | 1) Exercise with activity of class’s choice  
2) Feedback/Review                                                           | 25/10          | 1) Outdoor Activity 
2) Satisfaction and Suggestions for improvement, Measurement Time 2       |
NEECA Program Stakeholders

The primary stakeholders of the NEECA program are the children educated as well as their families. Since the program has focused on improving and promoting positive lifestyle behaviors it can be projected that the children will become more active, continue to properly manage their asthma, and have less emergency room visits. Family members can be seen as primary consumers since their children will have increased knowledge of healthy living and a better understanding of disease management. The American Lung Association’s Camp-Not-A-Wheeze is a primary consumer because of the enhancement the NEECA program can offer their campers as well as camper outcome. Other stakeholders include the Friendly Pines Camp grounds who host camp each year, since there is a health education program has been put in placed based on their existing camp schedule they can implement the program for other campers as well.

NEECA Program Budget and Projected Costs

The cost to attend camp each year is approximately $600.00 per camper for the entire week, which includes: transportation, 24-hour infirmary and one medical volunteer for every 2-3 campers, one-week food and lodging, all activities, and educational sessions. The American Lung Association (ALA) fundraises throughout the year prior to camp to raise money to keep fees low, and to offer camp sponsorships to as many children as possible. The materials to host the program are offered free on the CDC website and only require printing costs. The Camp-Not-A-Wheeze program currently host one rotation daily for Asthma education and has all printed materials for the program
covered through the ALA fundraising. There are five documents that need to be printed off for each child in order to gather the initial information needed.

Also, the My Pyramid program offers a classroom power point presentation at no cost, and a one page individualized food pyramid. Initial costs include six pages printed for each child. Also, the follow up costs of those who desire mailed information need to be calculated. The approximate cost of the program if each document was printed for $0.05 would be approximately $0.30 per camper. The total cost of the program ranges from $24 to $36 for the entire week for all campers (See Table 5). Any additional funds could be spent on letters home to parents, folders to contain all information, more information or educational related activities (See Table 6). The educators of the program are volunteers and would not receive a salary. Also, all media equipment, furniture, and writing utensils are provided in the classroom.

TABLE 5: NEECA Budget Analysis

<table>
<thead>
<tr>
<th>Item</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Cost</th>
<th>NEECA Amount (Minimum)</th>
<th>NEECA Amount (Maximum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material (Copies)</td>
<td>480</td>
<td>720</td>
<td>$0.05 (per page)</td>
<td>$24.00 (US Dollars)</td>
<td>$36.00 (US Dollars)</td>
</tr>
<tr>
<td>Teachers</td>
<td>1</td>
<td>Unlimited</td>
<td>Volunteer Health Professionals</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Student</td>
<td>80</td>
<td>120</td>
<td>$600 Camp Admission</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Total Costs</td>
<td></td>
<td></td>
<td></td>
<td>$24.00</td>
<td>$36.00</td>
</tr>
<tr>
<td>Variable</td>
<td>Cost</td>
<td></td>
<td></td>
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<tr>
<td>---------------------------------------------</td>
<td>------------------------------------------------</td>
<td></td>
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</tr>
<tr>
<td>Additional Supplementation for Presentations</td>
<td>Cost Unknown, Dependent on Instructor</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Additional Activity Handouts for Children</td>
<td>Cost Unknown, Dependent on Instructor</td>
<td></td>
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<tr>
<td>Information Handouts for Parents</td>
<td>Minimum of $0.05/camper, $4 to $6</td>
<td></td>
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<tr>
<td>Time 3 Mail Data Collection</td>
<td>$0.43 per envelope, plus material</td>
<td></td>
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<tr>
<td>Any Organizational Material</td>
<td>Cost Unknown, Dependent on Instructor</td>
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</table>
CHAPTER IV: NEECA PROGRAM EVALUATION

The implementation and evaluation of the Nutrition and Exercise Education for Children with Asthma program have been reviewed. The NEECA plans for evaluation include a six month and one year follow up. Items that will be discussed at each interview include: BMI plotted on appropriate graph, a 24-hour diet recall, the monthly estimate of emergency inhaler use for acute asthma attacks, as well as, visits to the emergency room visit, hospitalizations and visits to their primary care physician. However, the focus of the final chapter is to identify both the strengths and limitations of the NEECA program as well as the significance of the evaluation.

Strengths of the NEECA Program

Positive outcomes related to the implementation of a nutrition and exercise program at Camp-Not-a-Wheeze. The children in attendance at camp will not only benefit from education of asthma management but also learn health promotion behaviors. Some of the specific benefits of hosting NEECA at this camp are the increase simplicity of an already established program that is hosted by the American Lung Association (ALA).

The ALA sponsorship helps to cut down costs, which helps to create an affordable program. Since the children are staying at camp for a solid week the children will get repetitive learning and positive reinforcement with the nutrition camp food and snacks. The children are also fortunate that they have made new friends who will understand their asthma and help promote acceptance and optimal wellness.
The NEECA program does have an asthma management component, however, the program can be easily adaptable in other medical and non-medical settings. The instructors can easily learn the information packets and the information can be duplicated in all classroom setting within the age guidelines. Also, information packets can be created and sent home to help parents understand and reinforce the healthy lifestyle.

Lastly, the ALA also becomes eligible for government grants after installing a health promotion program like NEECA. With more funding, the ALA can sponsor more children to attend camp and other ALA hosted activities. The increase number of children with asthma in attendance will also increase those children that can benefit from the NEECA program.

Limitations of the NEECA Program

Since NEECA is a program that has been built around the existing schedule at Camp-Not-A-Wheeze and Friendly Pines Camp Grounds the program structure is not very flexible. The camp schedule only allows for short class periods, which requires the instructor to keep the class on task and not allow for discussion outside of the designated time periods. Not allowing for discussion could be a disadvantage for the young children with asthma who may benefit from each other’s experiences.

The program also does not allow for a weight loss program, which could be beneficial for a large portion of the children with asthma. The program focuses on weight maintenance through healthy eating and exercising, although weight loss may occur secondary to a change in lifestyle. The program also does not focus on difference that may be experienced in various cultural or economic backgrounds once the child returns
home. While at camp all of the children’s immediate influences and food options are identical, however, it is impossible to control the child influences and options once they return home. Further considerations may lead to the development of a continual support program either online, by phone, or mail.

Lastly, another significant limitation of the program is the inability to complete all pre-questionnaires prior to the arrival of the campers, instead all information is collected on the first day and little material can be taught the first day. Also, the post-questionnaires that will occur at 6 months after camp may not be successful if there is incomplete data collection from the NEECA participants. Some children may have different personal information created difficulty in contacting them or some children or families may choose no longer to participate. If there are enough volunteers and enough time, the ALA volunteers will call back campers and collect the appropriate information, however there is no guarantee that they will be available. Also the fourth and final data collection occurs at camp the following year, however, the campers may not return for a second camp experience.

Conclusion of NEECA Program

With asthma being the leading cause of hospitalization in the United States and obesity being a growing epidemic, the installation of a health promotion program would be greatly beneficial. Camp-Not-A-Wheeze allows for a unique teaching opportunity to educate children with asthma about asthma management and Nutrition and Exercise Education. NEECA is an evidence-based program, which can improve eating patterns and physical activity among school-age children attending summer camp. The
importance of asthma management has been encouraged in order to effectively participate in the encouraged sixty-minute daily exercise. Due to the evidence of need and projected benefit from the NEECA program its implementation at Camp-Not-A-Wheeze is a promising health promotion program.
FIGURE 1: NEECA Illustration - Asthma Pathophysiology
FIGURE 2: NHANES Report of US Overweight Children and Adolescents

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<tbody>
<tr>
<td>Ages 2 through 5</td>
<td>5%</td>
<td>5%</td>
<td>7.2%</td>
<td>13.9%</td>
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<tr>
<td>Ages 6 through 11</td>
<td>4%</td>
<td>6.5%</td>
<td>11.3%</td>
<td>18.8%</td>
</tr>
<tr>
<td>Ages 12 through 19</td>
<td>6.1%</td>
<td>5%</td>
<td>10.5%</td>
<td>17.4%</td>
</tr>
</tbody>
</table>

*Sex-and age-specific BMI ≥ 95th percentile based on the CDC growth charts,

Sources:


APPENDIX A:

NEECA ASTHMA SELF-MANAGEMENT PLANS
Asthma Action Plan (AAP)
Asthma Action Plan

General Information:
- Name ____________________________
- Emergency contact ____________________________
- Physician/Health Care Provider ____________________________
- Physician Signature ____________________________
- Phone numbers ____________________________
- Phone numbers ____________________________
- Date ____________________________

Severity Classification:
- Mid Intermittent
- Moderate Persistent
- Severe Persistent

Triggers:
- Colds
- Smoke
- Weather
- Exercise
- Dust
- Air pollution
- Animals
- Food
- Other

Exercises:
1. Pre-medication (how much and when)
2. Exercise modifications

Green Zone: Doing Well

Symptoms
- Breathing is good
- No cough or wheeze
- Can work and play
- Sleeps all right

Peak Flow Meter
- More than 80% of personal best or ____________

Yellow Zone: Getting Worse

Symptoms
- Some problems breathing
- Cough, wheeze or chest tight
- Problems working or playing
- Wake at night

Peak Flow Meter
- Between 50 to 80% of personal best or ____________ to ____________

Contact Physician if using quick relief more than 2 times per week.

Contact Physician if using quick relief more than 2 times per week:

Control Medications
- How Much to Take
- When To Take It

Red Zone: Medical Alert

Symptoms
- Lots of problems breathing
- Cannot work or play
- Getting worse instead of better
- Medication is not helping

Peak Flow Meter
- Between 0 to 60% of personal best or ____________ to ____________

Ambulance/Emergency Phone Number:

Control medications and add:
- Medicine
- How Much to Take
- When To Take It

Go to the hospital or call for an ambulance if:
- Still in the red zone after 15 minutes
- If you have not been able to reach your physician/health care provider for help

Call an ambulance immediately if the following danger signs are present:
- Trouble breathing/talking due to shortness of breath
- Lips or fingernails turn blue

(American Lung Association, 2008)
Peak Flow Meter Chart
### Peak Flow Recording Times

<table>
<thead>
<tr>
<th>Day</th>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
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<tbody>
<tr>
<td>Time</td>
<td>AM/PM</td>
<td>AM/PM</td>
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<td>100</td>
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</tbody>
</table>

Changes in Medication

Notes

(American Lung Association, 2008)
APPENDIX B:

SELF-EFFICACY IN CHILDREN WITH ASTHMA
Self-Efficacy Questionnaire
Below are sentences about exercise. Exercise is being active enough to breathe fast, get sweaty, or have your heart beat fast.

Please place a check (✓) in the box to show how true each sentence is about you.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>G1. I could exercise even if I was tired.</td>
<td>Not at all true</td>
<td>Not very true</td>
<td>In-between</td>
<td>Sort of true</td>
<td>Very true</td>
</tr>
<tr>
<td>G2. I could exercise even if I had other things I wanted to do.</td>
<td>Not at all true</td>
<td>Not very true</td>
<td>In-between</td>
<td>Sort of true</td>
<td>Very true</td>
</tr>
<tr>
<td>G3. I could exercise even if I had to exercise alone.</td>
<td>Not at all true</td>
<td>Not very true</td>
<td>In-between</td>
<td>Sort of true</td>
<td>Very true</td>
</tr>
<tr>
<td>G4. I could exercise even if I had a bad day at school.</td>
<td>Not at all true</td>
<td>Not very true</td>
<td>In-between</td>
<td>Sort of true</td>
<td>Very true</td>
</tr>
<tr>
<td>G5. I could exercise even if I was feeling lazy.</td>
<td>Not at all true</td>
<td>Not very true</td>
<td>In-between</td>
<td>Sort of true</td>
<td>Very true</td>
</tr>
<tr>
<td>G6. I could exercise even if I was not very good at it.</td>
<td>Not at all true</td>
<td>Not very true</td>
<td>In-between</td>
<td>Sort of true</td>
<td>Very true</td>
</tr>
<tr>
<td>G7. I could exercise even if I was sore from exercising the day before.</td>
<td>Not at all true</td>
<td>Not very true</td>
<td>In-between</td>
<td>Sort of true</td>
<td>Very true</td>
</tr>
<tr>
<td>G8. I could exercise even if I was not in the mood.</td>
<td>Not at all true</td>
<td>Not very true</td>
<td>In-between</td>
<td>Sort of true</td>
<td>Very true</td>
</tr>
</tbody>
</table>

(Pender, 2007)
Self-Efficacy Score
Scoring Instructions for Self-Regulatory Efficacy

Score as follows:
Not at all true – 1
Not very true – 2
In-between – 3
Sort of true – 4
Very true – 5

Add the scores across all items and calculate mean self-regulatory score.

(Pender, 2007)
APPENDIX C:

BENEFITS AND BARRIERS TO EXERCISE IN CHILDREN WITH ASTHMA
Benefits to Exercise Questionnaire
Below are sentences about exercise. Exercise is being active enough to breathe fast, get sweaty, or have your heart beat fast.

Please place a check (√) in the box to show how true each sentence is about you.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11. A reason I might exercise is because when I exercise I look better.</td>
<td>Not all true</td>
<td>Not very true</td>
<td>In between</td>
<td>Sort of true</td>
</tr>
<tr>
<td>12. A reason I might exercise is because when I exercise I have more energy.</td>
<td>Not all true</td>
<td>Not very true</td>
<td>In between</td>
<td>Sort of true</td>
</tr>
<tr>
<td>13. A reason I might exercise is because when I exercise I feel happier.</td>
<td>Not all true</td>
<td>Not very true</td>
<td>In between</td>
<td>Sort of true</td>
</tr>
<tr>
<td>14. A reason I might exercise is because when I exercise I have fun.</td>
<td>Not all true</td>
<td>Not very true</td>
<td>In between</td>
<td>Sort of true</td>
</tr>
<tr>
<td>15. A reason I might exercise is because when I exercise I make more friends.</td>
<td>Not all true</td>
<td>Not very true</td>
<td>In between</td>
<td>Sort of true</td>
</tr>
<tr>
<td>16. A reason I might exercise is because when I exercise I get stronger.</td>
<td>Not all true</td>
<td>Not very true</td>
<td>In between</td>
<td>Sort of true</td>
</tr>
<tr>
<td>17. A reason I might exercise is because when I exercise I like myself more.</td>
<td>Not all true</td>
<td>Not very true</td>
<td>In between</td>
<td>Sort of true</td>
</tr>
<tr>
<td>18. A reason I might exercise is because when I exercise I get in better shape.</td>
<td>Not all true</td>
<td>Not very true</td>
<td>In between</td>
<td>Sort of true</td>
</tr>
<tr>
<td>19. A reason I might exercise is because when I exercise I feel healthier.</td>
<td>Not all true</td>
<td>Not very true</td>
<td>In between</td>
<td>Sort of true</td>
</tr>
</tbody>
</table>

(Pender, 2007)
Benefits to Exercise Score
Scoring Instructions for Perceived Benefits of Action

Score as follows:
Not at all true – 1
Not very true – 2
In-between – 3
Sort of true – 4
Very true – 5

Add the scores across all items and calculate mean benefits score.

(Pender, 2007)
Barriers to Exercise Questionnaire
Below are sentences about exercise. Exercise is being active enough to breathe fast, get sweaty, or have your heart beat fast.  

Please place a check (✓) in the box to show how true each sentence is about you.

| H1. I might not exercise if I didn’t have enough time. | Not at all true | Not very true | In between | Sort of true | Very true |
| H2. I might not exercise if I had too many chores to do. | Not at all true | Not very true | In between | Sort of true | Very True |
| H3. I might not exercise if I didn’t have a good place to exercise. | Not at all true | Not very true | In between | Sort of true | Very True |
| H4. I might not exercise if the weather was too bad to exercise. | Not at all true | Not very true | In between | Sort of true | Very True |
| H5. I might not exercise if I didn’t have the right clothes/shoes to exercise. | Not at all true | Not very true | In between | Sort of true | Very True |
| H6. I might not exercise if I didn’t know how to do a certain type of exercise. | Not at all true | Not very true | In between | Sort of true | Very True |
| H7. I might not exercise if I didn’t have the right equipment to exercise. | Not at all true | Not very true | In between | Sort of true | Very True |
| H8. I might not exercise if I had too much homework. | Not at all true | Not very true | In between | Sort of true | Very True |
| H9. I might not exercise if I didn’t have anyone to exercise with me. | Not at all true | Not very true | In between | Sort of true | Very True |
| H10. I might not exercise if I didn’t like to exercise. | Not at all true | Not very true | In between | Sort of true | Very True |

(Pender, 2007)
Barriers to Exercise Score
Scoring Instructions for Perceived Barriers of Action

Score as follows:
Not at all true – 1
Not very true – 2
In-between – 3
Sort of true – 4
Very true – 5

Add the scores across all items and calculate mean barriers score.

(Pender, 2007)
APPENDIX D:

SOCIAL SUPPORT SCALE IN CHILDREN WITH ASTHMA
Social Support Scale Questionnaire
During a usual week, how much do the **people in your family** do these things with you? Place a check (✓) in a box under each person for your answer.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mother</th>
<th></th>
<th>Father</th>
<th></th>
<th>Brother(s)/Sister(s)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Take me to play sports or exercise</td>
<td>L1.</td>
<td>Never</td>
<td>L2.</td>
<td>Never</td>
<td>L3.</td>
<td>Never</td>
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<td></td>
<td>Sometimes</td>
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During a normal week, how much do your **friends** do these things with you?

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<td>Encourage me to exercise or play hard</td>
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<td>Praise me for exercising</td>
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<td>Criticize me for exercising</td>
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(Pender, 2007)
Social Support Scale Score
Scoring Instructions for the Exercise Social Support Scale

In scoring:

L1 to L19, L22 to L26

1 = Never  2 = Sometimes  3 = Often  0 = Don't Know

L10 to L21, L26 are reversed scored

1 = Often  2 = Sometimes  3 = Never  0 = Don't Know

The total Exercise Social Support Scale Score is the sum of L1 to L19, L22 to L25, and reverse scored L10, L20, L21, and L26.

(Pender, 2007)
APPENDIX E:

NEECA NUTRITION MANAGEMENT IN CHILDREN WITH ASTHMA
24-Hour Diet Recall
# 24 Hour Diet Recall

Please be as specific and honest as possible. Thank You.

<table>
<thead>
<tr>
<th>Food (List all individually)</th>
<th>Serving Size/Time/Meal</th>
<th>Where (Home/School)</th>
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My Pyramid Level 1 Lesson 1
Lesson 1: Exploring MyPyramid for Kids

Getting Started:

Hang the MyPyramid for Kids poster where your students can see it. Ask students to describe what they see – colored stripes, pictures of food, stairs, and so on. Use this discussion to assess your students’ understanding of MyPyramid for Kids.

Activity: What’s On the Poster?

1. Point out that foods on the poster are arranged in groups. Help students use the key to learn which color represents which food group. Which of the colored stripes are the largest? Point out that these are foods that children should choose more often. Which are the smallest? These are foods that children should choose less often.

2. Point out that everyone needs food to live and grow. But if people eat too much of some foods high in sugar and fat, they don’t have enough room to eat other foods that are good for them. Ask students to name healthy choices from each of the food groups.

3. Discuss each food group in turn. Ask students to identify the foods they know that are shown on the poster. What are some other foods from each group that they like or know about?

4. At this age, some students may not know what a “grain” is. Grains come from plants like wheat, corn, and oats. They are used to make foods like bread, cereal, tortillas, and corn muffins. Popcorn is a grain-group food, too.

5. What’s the thin yellow stripe? It represents oils, which can be found in foods like nuts or fish or added to foods as soft margarine or salad oil. Note how thin the stripe is. Most people need to limit the amount of oils they eat.

6. Why are there stairs? They represent physical activity. Look at the variety of activities shown on the poster. How many do you see? Part of being healthy is keeping physically active. Ask students to describe some of the ways they stay active. (Remind them that walking the dog, doing household chores and other daily activities count, as well as sports activities.)

7. Give each student a copy of the MyPyramid for Kids handout. Using the wall poster as a reference, have students color the stairs to match the colors on the poster. In the space provided have students draw or paste a picture of a smart food choice from each group and write in the name of the food group. You may want to have students bring in pictures of their own food choices for healthy eating from each group and make their own pyramid.
Group Activity: Moving More Game

Physical activity is important for good health. Children need to eat enough food to support growth and should be physically active at least 60 minutes every day, or most days. This game helps kids think about the many ways to be physically active while playing a movement game.

Ask students to brainstorm about active things they like to do. These could be sports moves like dunking a basketball and kicking a soccer ball, dance moves like hip hop or ballet, or just everyday activities like raking leaves or climbing stairs. As students make suggestions, write each on a 3 x 5 card.

Now have students go to the front of the room. Draw a card and read what’s on it. Have students act out that movement for 15 to 30 seconds. Then draw another card. If your students are readers, they can also take turns drawing and reading cards. To keep the tempo up, add some music in the background. (Favon Panther™ songs are included on the enclosed CD ROM.)

Lunchroom Link:

Look at the lunch menu for today. Ask students into which food groups each of the items on the menu would fit. You may need to explain mixed foods like pizza and hamburgers, which fit in several groups. (Pizza = grain, milk, vegetable, meat)

Home Connection:

Have students take their copy of the MyPyramid for Kids handout home to their parents. Encourage them to talk with parents about what they have learned. Also ask students to identify foods from each food group at home.

(USDA, 2008)
Lesson 2: Eat Smart with MyPyramid for Kids

Activity: Eat Smart with MyPyramid for Kids

1. Tell students that they are going to learn about many examples of foods from each of the food groups shown on MyPyramid for Kids. Hand out a copy of Eat Smart with MyPyramid for Kids to each student.

2. Have students complete the worksheet.

3. Review the worksheets with the students and talk to them about each food group. Some points to cover are:

   - **Grains** — Point out foods students might not think of as grains — oatmeal, corn meal, or rice and popcorn. Tell students that some grains are whole grains. At least half the grains they eat should be whole grain. Some names for whole grains are whole wheat, whole-grain corn, and oatmeal. Show them the words “whole grain” on the ingredients label or the front of a cereal box and ask them to look for it on a cereal box at home.

   - **Vegetables** — Do your students eat fresh vegetables? Frozen? Canned? Dark green and orange vegetables are especially important. (Examples include spinach, broccoli, carrots, and sweet potatoes.) Ask students to name dark green and orange vegetables they’d like to try.

   - **Fruits** — Explain that fruit can be fresh, canned, frozen, or dried. Ask children about their favorite fruit. What type or form do they eat?

   - **Milk** — Ask students to name some foods in the milk group (milk, cheese, yogurt, ice cream). Where does milk come from? Do they drink milk every day? For children who are lactose intolerant, there are lactose-free products.

   - **Meat and Beans** — Ask students to name foods from the meat and beans group (meat, fish, chicken, turkey, eggs, dry beans, and peas, nuts, and seeds). Do they ever eat beans at home for dinner?
**Group Activity: Play Pyramid Go Fish**

Students play Pyramid Go Fish with food cards. This activity will give students additional practice in sorting foods into groups.

**Getting Started:**

- Duplicate food illustrations from CD ROM and cut into cards.
- Put students into groups of four and distribute 30 cards to each group.
- **Now play Pyramid Go Fish.** The dealer deals out four cards to each student, and places the rest in the middle. The first student (let’s call him Michael) asks the student sitting to his left, “Kayla, do you have a fruit?” If Kayla has a fruit she says, “Yes, I do,” and hands her card to Michael, who then places his pair of cards on the table. Michael is then able to ask the next student a question.
- **If Kayla doesn’t have a fruit, she replies, “No I don’t have a fruit, Go fish,”** and Michael can take a card from the pile in the middle. It is then Kayla’s turn to ask the student on her left for a card. The students continue to ask questions and find cards until all the pairs are found. The student with the most pairs wins.
Eat Smart with MyPyramid for Kids

Draw a circle around the foods that are in the Grain Group.
- Slice of bread
- Baked potato
- Popcorn
- Pasta (bowtie)
- Cereal
- Candy bar

Draw a rectangle around the foods that are in the Vegetable Group.
- Carrots
- Spinach
- Grapes
- Pasta (macaroni)
- Broccoli
- Swiss cheese

Draw a square around the foods that are in the Fruit Group.
- Corn
- Orange juice
- Apple
- Banana
- Strawberries
- Muffin

Draw a triangle around the foods that are in the Milk Group.
- 1% Milk
- Yogurt
- Egg
- American cheese
- Cookies
- Orange juice

Draw an oval around the foods that are in the Meat and Beans Group.
- Peanut butter
- Egg
- Beans
- Chicken
- Pork chop
- Fish

(USDA, 2008)
My Pyramid Level 1 Lesson 3
Lesson 3: Vary Your Veggies and Focus on Fruits

Getting Started:
Challenge students to name as many fruits and vegetables as they can in 1 minute. Write these on the board by food group.

Activity: Fruit and Veggie Diary

1. Point out that fruits and vegetables are foods children need to grow and be healthy.

2. Ask children to look at the list they just developed. Are there any fruits or vegetables they have never tried? Introduce additional foods they may not have identified.

3. Distribute the My Fruit and Vegetable Diary reproducible to each student. Have students cut out the pages and put them in the correct order. Punch a hole through the upper-left-hand corner and have children tie the diary with yarn or string. Every day for a week have students write (or draw a picture of) all the fruits and vegetables they ate that day.

4. At the end of the week, ask students to name the foods they ate. Talk about the variety of fruits and vegetables.

Materials:
- My Fruit and Vegetable Diary reproducible for each student
- Holepunch
- Scissors for each student
- Yarn or string
- Fruit and Vegetable Challenge Kit

(USDA, 2008)
Group Activity: Graph It

You can turn the information from the Fruit and Vegetable Diaries into a graphing activity. Ask students to total the number of fruits and vegetables the class ate the day before. Help the class present this information in the form of a graph for your classroom wall. (You might use green squares to represent vegetables and red squares to represent fruits, just like the stripes on MyPyramid for Kids.) Each day, they can graph the class totals or their personal totals. (Add an individual graph option. Talk about how children can increase the number of fruits and vegetables on their graph.)

Lunchroom Link:

Have students identify the fruits and vegetables they ate for lunch today. Include those who ate the school lunch and those who brought a lunch from home. Work with the Cafeteria Manager to introduce new foods to students. Use the enclosed Fruit and Vegetable Challenge Kit; follow the instructions in the folder.

Home Connection:

Have students share their fruit and vegetable diary with their parents.
Make a Fruit and Vegetable Diary

1. Cut out the pages on the dotted lines.
2. Put them in the correct order.
3. Have your teacher make a hole through the circle.
4. Tie the pages together.
5. Draw or write the fruits and vegetables you eat.
6. How many fruits and vegetables did you eat each day?

My Fruit and Vegetable Diary

Name: ____________________________

MONDAY

Fruits: __________________________
Vegetables: ______________________

TUESDAY

Fruits: __________________________
Vegetables: ______________________

WEDNESDAY

Fruits: __________________________
Vegetables: ______________________

THURSDAY

Fruits: __________________________
Vegetables: ______________________

FRIDAY

Fruits: __________________________
Vegetables: ______________________

(USDA, 2008)
Lesson 1: 
MyPyramid for Kids

Getting Started:

Hang the MyPyramid for Kids poster on the wall so all students can see it. Pass out the MyPyramid for Kids black-and-white handout to each student.

Activity: A Conversation with Pyramid Pal

This activity introduces students to MyPyramid for Kids concepts in a fun way.

Read A Conversation with Pyramid Pal aloud. During the story, help students answer the questions based on the teacher’s talking points.

A Conversation with Pyramid Pal

Pyramid Pal: Hi. I’m the kid climbing the side of the pyramid on the classroom wall. Did you notice that I’m running up the steps? That’s because I’ve got lots of energy from eating right and exercising a lot. What do you do for exercise? On the steps (of the black-and-white handout), write the ways you stay active.

Pyramid Pal: Let’s take a look at the MyPyramid for Kids I’m climbing. It’s called MyPyramid for Kids because it’s just for you.

Pyramid Pal: Look at the MyPyramid for Kids poster on the wall. Now wave at me. Come on, wave. If I weren’t stuck on this poster, I’d wave back. The poster shows how much food kids our age should eat.

Pyramid Pal: Do you know the food groups? Do you see the orange stripe next to the steps? That’s the grains group. Do you know what grains are?

Teacher: Who can name the grain group foods illustrated on the poster? Write the word “grains” in the box under the grain stripe on your handout.

Pyramid Pal: Do you know what whole grains are?

Teacher: Whole wheat products are commonly eaten whole grains. Examples of whole-grain foods include: whole-grain cereal, whole-wheat bread, and oatmeal. Explain that just because bread is brown, it’s not necessarily whole wheat. The only way to tell is to look at the ingredient label. The first ingredient should say “whole wheat.”

(USDA, 2008)
MyPyramid
Eat Right. Exercise Have Fun.
MyPyramid.gov

(USDA, 2008)
My Pyramid Level 2 Lesson 2
Lesson 2: Food Math

Getting Started:

Have students look at the MyPyramid for Kids poster. Point out that MyPyramid for Kids tells how much of each food group to eat. MyPyramid for Kids gives the amounts for each day in ounces and cups. Grains and meats are weighed in ounces. For example, a piece of bread is 1 ounce, so is a cup of ready-to-eat breakfast cereal or one small tortilla. A small chicken breast half is 3 ounces. Vegetable, fruit, and milk amounts are given in cups. For example, one small apple, about 12 baby carrots, and an 8-ounce glass of milk count as 1 cup equivalent.

You may want to help students understand what 1 cup of vegetables or fruit looks like. Put food in a measuring cup, then pour it onto a paper plate. Or, mention that a baseball is about the size of 1 cup and a small computer mouse is ½ cup.

Ask students to estimate how many fruits and vegetables they eat in a typical day. Point out that most students their age should eat more foods from these food groups. They are high in nutrients.

Activity: Food Math

- Have students work in pairs. Hand out the Food Math worksheet. Tell students they are going to choose foods they think would make a healthy menu for a day for Jason. Their menu should include breakfast, lunch, dinner, and a snack.

- The menu they create must include the right amount of food from all the food groups. For one day, that would be: 6 ounces of grains, 2½ cups of vegetables, 1½ cups of fruit, 3 cups of milk, and 5 ounces of meat or beans. (This amount of food is based on a 1,800 calorie meal, the estimated energy requirement for a moderately active 9- to 10-year-old.) Before students begin work, review each of the food groups and the amounts needed.

(USDA, 2008)
• Have them write their menu on a sheet of paper including the amount of food for each entry and the totals for each group along the bottom of the sheet.

• Discuss students’ choices and have them check their math. Also have students check to see whether half their choices from the grain group are whole grains. Did they choose any dark green or orange vegetables?

(Note to teacher: Food Math will help prepare students to play the MyPyramid Blast-Off game on the enclosed CD-ROM.)

Group Activity: Be Hip-Hop Healthy

Divide students into groups. Have each group write a rap (at least eight lines long) about the importance of eating from all the food groups. Have the group come up with movements that go along with their rap. Groups should perform their raps for the entire class. Then post a written copy of the rap on your bulletin board. (To help the students get started, you can use the Power Panther® songs on the enclosed CD-ROM that have a “hip-hop” beat.)

Lunchroom Link:

Invite a staff member from your school food service program to talk about how they create balanced menus and determine the amount of each food to serve. (Have the students work with the lunchroom staff to plan a menu and then announce over the PA system when the menu is served, recognizing the students’ efforts.)

(USDA, 2008)
Food Math

Jason is 9 years old. He's physically active sometimes. Each day, he needs to eat:

<table>
<thead>
<tr>
<th>Grains</th>
<th>Vegetables</th>
<th>Fruit</th>
<th>Milk</th>
<th>Meat and Beans</th>
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<td>6 ounces</td>
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Help Jason decide what to eat today. Plan breakfast, lunch, dinner, and a snack. Be sure he gets all the food he needs from each group. (Food items may be selected more than once.)

**Grains 6 ounces**
- 1 slice whole-wheat toast* (1 oz eq)
- 5 whole-wheat crackers* (1 oz eq)
- 1 slice white bread (1 oz eq)
- 1 slice whole-wheat bread* (1 oz eq)
- 1 cup whole-grain ready-to-eat breakfast cereal* (1 oz eq)
- 1/2 cup cooked brown rice* (1 oz eq)
- 1 cup cooked pasta (1 oz eq)
- 1 hamburger bun (1 oz eq)
- 3 cups lowfat popcorn* (1 oz eq)

*Items marked with a * are whole-grain

**Vegetables 2 1/2 cups**
- 6 baby carrots* (1/2 cup eq)
- 1 large ear of corn (1 cup eq)
- 1 medium baked potato (1 cup eq)
- 1 cup cooked greens (1 cup eq)
- 1 large baked sweet potato (1 cup eq)
- 3 cups broccoli* (1 cup eq)
- 1/2 cup tomato juice (1/2 cup eq)
- 1 cup chopped lettuce (1/2 cup eq)

*Items marked with a * are dark green or orange vegetables

**Fruits 1 1/2 cups**
- 1 small apple or 1/2 large apple (1 cup eq)
- 1 large orange (1 cup eq)
- 1 snack-sized container of peaches (1/2 cup eq)
- 1 large plum (1/2 cup eq)
- 1 small box raisins (1/2 cup eq)
- 1 cup 100% orange juice (1 cup eq)
- 1 medium wedge cantaloupe (1/2 cup eq)
- 1 small wedge watermelon (1 cup eq)

**Milk 3 cups**
- 1/2 cup lowfat or fat-free
cottage cheese (1/4 cup eq)
- 1 cup fat-free milk (1 cup eq)
- 1 snack-sized lowfat or fat-free yogurt (1/2 cup eq)
- 1 half-pint container 1% or 2% milk (1 cup eq)
- 2 ounces of lowfat or fat-free American cheese (1 cup eq)
- 1 1/4 ounces of lowfat or fat-free cheddar cheese (1 cup eq)
- 1/4 cups light ice cream (1 cup eq)

**Meat and Beans 5 ounces**
- 1 ounce of nuts (1 oz eq)
- 1 cup split pea soup (1 oz eq)
- 1 small chicken breast half (1 oz eq)
- 1 small lean hamburger (1 oz eq)
- 1 hard-boiled egg (1 oz eq)
- 1 tablespoon peanut butter (1 oz eq)
- 1/4 cup of pinto beans (1 oz eq)
- 1 slice of turkey (1 oz eq)

Key: (1 oz eq) means (equals 1 ounce equivalent)
Lesson 3: Vary Your Veggies and Focus on Fruits

Lesson Highlights

Objective

Students will:
- Learn more about the nutritional qualities of fruits and vegetables.
- Brainstorm about ways they can increase their intake of fruits and vegetables.
- Set a goal of eating more fruits and vegetables and develop specific steps to reach their goal.

Curriculum Connections:
Language arts

Student Skills Developed:
- Thinking and analysis
- Writing
- Setting goals

Materials Needed:
- Steps to a Healthier You worksheet for each student

Activity: Vary Your Veggies and Focus on Fruits

- Ask students if they eat fruits and vegetables every day.
- Ask them to name the fruits and vegetables they usually eat.
- Talk to students about the importance of fruits and vegetables. Eating fruits and vegetables can help them be healthy.
  - Fruits and vegetables are excellent sources of many nutrients, including vitamins A and C, potassium, and dietary fiber.
  - Most fruits and vegetables are naturally low in fat and calories and do not contain cholesterol.
  - Vitamin A keeps eyes and skin healthy and helps to protect against infections.
  - Vitamin C helps heal cuts and wounds and keeps teeth and gums healthy.
  - Fiber keeps food moving through the digestive tract.
- Dark green and orange vegetables are important to eat. See if students can name some.
- French fries, which make up one-fourth of all vegetables eaten by elementary school students, are an exception. They are high in fat and calories. A medium order of fries has 460 calories, more than one-fourth the total daily calorie intake appropriate for most 8- and 9-year-olds. A medium baked potato, however, has only about 100 calories.

Now pass out the worksheet, Steps to a Healthier You.

- Have students review the goal of trying a new fruit and vegetable.
- Ask students what vegetables and fruits they already enjoy. Remember that dried, frozen, or canned fruits and vegetables count, too.
- Have students complete the worksheet.
- Next, have students brainstorm some other ways they can eat more fruits and vegetables. Add these to their worksheet.
- Finally, complete the "Where and How" box.

(USDA, 2008)
Steps to a Healthier You

My Fruit and Vegetable Goals

**Fruits**
Circle the names of the fruits you have eaten:
- mango
- papaya
- kiwifruit
- cantaloupe
- star fruit
- pineapple
- strawberry
- blueberry

Other fruits I have eaten:

Write the name of a fruit you would like to try:

How will you eat this fruit? (Perhaps on cereal, as a snack, for dessert, with dinner, or on pancakes.)

**Vegetables**
Circle the names of the vegetables you have eaten:
- spinach
- collard greens
- sweet potato
- broccoli
- okra
- zucchini
- squash

Other vegetables I have eaten:

Write the name of a vegetable you would like to try:

How will you eat this vegetable? (Perhaps for a snack, as a salad, with dip, or for lunch.)

**Where and How**
I will try these foods by: asking my parents to purchase them, helping my parents prepare these foods, choosing them from a restaurant menu, eating them from the school lunch menu, or eating them at a friend’s house.

Signature

Date

(USDA, 2008)
My Pyramid Level 3 Lesson 1
Lesson 1: Getting the Most Nutrition From Your Food

Getting Started:

Hang the MyPyramid for Kids poster (full-text side) where everyone can see it. Pass out the black-and-white MyPyramid for Kids handout to each student. Review the food groups and messages with your students. Have students follow along and write the name of the food groups on the handout.

Here are some points to discuss with your students:

- **Make half your grains whole.** Whole grains are higher in fiber and some nutrients than other grains. Look for whole wheat or other whole grains on the ingredient label of bread bags and cereal boxes. It should be the first thing listed. Ask your students whether they can name other grains (oats, rye, corn). Most grains are ground into flour, then made into grain foods like cereals, bread, and tortillas. Popcorn is a whole grain too.

- **Vary your veggies.** Most people do not eat enough vegetables, especially dark green and orange vegetables. Ask students if they can name dark green and orange vegetables (broccoli, collard greens, dark green leafy lettuce, kale, romaine lettuce, spinach, butternut squash, carrots, pumpkin, and sweet potatoes). Vegetables have vitamins and minerals that are important for a healthy body.

- **Focus on fruits.** Variety is important. Tell students they should try to eat different colors of fruit such as oranges, cantaloupes, strawberries, grapes, and blueberries. Juice drinks should be 100% juice.

- **Get your calcium-rich foods.** Milk and milk products are sources of calcium. Tell students that they are at an age when calcium is most important because their bones are growing quickly. Ask them to name other milk products (cheese, yogurt, ice cream). Check the labels for fat content. (Students may be interested to learn that there is calcium in dark green leafy vegetables, but it takes a lot to equal the calcium in a glass of milk.)

- **Go lean with protein.** Protein is needed for growth; however, many Americans eat too much protein. Extra calories of any kind get turned into fat. (Students will learn more about protein in Lesson 2.)

- **Physical activity.** MyPyramid for Kids focuses on physical activity. Ask students whether they get 60 or more minutes of physical activity per day. Do they think most kids do? Why or why not?
Activity: MyPyramid Worksheet

Pass out the MyPyramid for Kids Worksheet to students. Ask students to fill out the worksheet by listing all the foods (and the amounts) they ate yesterday for breakfast, lunch, dinner, and snacks. After students have completed this task, have students categorize the foods they ate yesterday into food groups. (You may need to help students with combination foods. For example, a slice of pizza would fit into several food groups such as grains, vegetables, milk, and meat and beans.) Next, have them list their physical activity and time spent on each activity. Then have the students rate how they did yesterday and set goals for tomorrow.

Group Activity: Play the MyPyramid Blast-Off Game

As a follow-up to the lesson, have students play the MyPyramid Blast-Off Game on the enclosed CD-ROM or at teamnutrition.usda.gov or MyPyramid.gov educators’ page. In this game, students see if they can make the MyPyramid rocket fly. To do this they need to fill the rocket with the right “fuel”—a day’s worth of smart food choices and physical activity. They will use the knowledge learned from this lesson to help them make the best choices. After students have played the game, ask what they have learned.

Lunchroom Link:

Have students analyze 1 week of lunchroom menus, identifying which foods come from each of the food groups and if the foods fit on the top or bottom of MyPyramid for Kids.

(USDA, 2008)
## MyPyramid Worksheet

Check how you did yesterday and set a goal to aim for tomorrow

<table>
<thead>
<tr>
<th>Write in Your Choices From Yesterday</th>
<th>Food and Activity</th>
<th>Tip</th>
<th>Goal</th>
<th>How Much?</th>
<th>My Points for Today</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast:</td>
<td>Grains</td>
<td>Make at least half your grains whole grains.</td>
<td>6 ounce equivalents</td>
<td>1 slice bread, 1 cup dry cereal, or 1/2 cup cooked rice, pasta, or corn.</td>
<td>ERUSSA22222</td>
</tr>
<tr>
<td>Lunch:</td>
<td>Vegetables</td>
<td>Ounce your plate with all kinds of great tasting veggies.</td>
<td>2/3 cup</td>
<td>1/2 cup dark greens, orange, spinach, dry beans and peas, or other vegetable.</td>
<td>ERUSSA22222</td>
</tr>
<tr>
<td>Snack:</td>
<td>Fruits</td>
<td>Make most choices fruit, not juice.</td>
<td>1/2 cup</td>
<td>1/2 cup</td>
<td>ERUSSA22222</td>
</tr>
<tr>
<td>Dinner:</td>
<td>Milk</td>
<td>Choose fat-free or lowfat most often.</td>
<td>3 cups</td>
<td>1 cup nonfat or 1% evaporated milk</td>
<td>ERUSSA22222</td>
</tr>
<tr>
<td>Snack:</td>
<td>Meat and Beans</td>
<td>Choose lean meat and chicken or turkey. Vary your choices—more fish, beans, peas, tuna, and seeds.</td>
<td>3 ounce equivalents</td>
<td>1 ounce meat, 1/2 cup chicken or turkey, or 1 egg, 1 T. restrained fat, or 1/2 cup dry beans or peas</td>
<td>ERUSSA22222</td>
</tr>
<tr>
<td>Physical activity</td>
<td>Physical Activity</td>
<td>Build more physical activity into your daily routine at home and school.</td>
<td>At least 60 minutes of moderate to vigorous activity a day or more days.</td>
<td></td>
<td>ERUSSA22222</td>
</tr>
</tbody>
</table>

How did you do yesterday?  [ ] Great  [ ] So-So  [ ] Not So Great

My food goal for tomorrow is: ____________________________

My activity goal for tomorrow is: ____________________________

---

(USDA, 2008)
My Pyramid Level 3 Lesson 2
Lesson 2:
Eating Out and Eating In — Go Lean With Protein

Getting Started:

- Ask several students to share what they ate for dinner yesterday. Let several students respond. Point out that many students started by naming a food that is a member of the meat and beans group — chicken, hamburger, fish.

- Tell students that these are foods that contain protein. Challenge students to list as many foods as they can from this food group.

- Did students list the plant foods that are part of this group — dry peas and beans? (black beans, chickpeas, lentils, kidney beans, lima beans, navy beans, pinto beans, soy beans, split peas, tofu, white beans) Nuts and seeds? (almonds, cashews, hazelnuts, mixed nuts, pecans, pistachios, pumpkin seeds, sesame seeds, sunflower seeds, walnuts) Peanuts and peanut butter? Point out that these foods are staples in many cultures.

- Tell students that all these foods include protein. Scientists sometimes call protein the building block for bones, muscles, cartilage, skin, and blood.

- Point out that most people get enough of these foods. One of the challenges is in choosing foods from this group that are lower in fat.
Where’s the Fat?

Popular Fast Foods

<table>
<thead>
<tr>
<th>Food</th>
<th>Total Fat (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamburger</td>
<td>9</td>
</tr>
<tr>
<td>Quarter-pound hamburger</td>
<td>18</td>
</tr>
<tr>
<td>Fried fish filet sandwich</td>
<td>18</td>
</tr>
<tr>
<td>Crispy fried chicken</td>
<td>23</td>
</tr>
<tr>
<td>Chicken nuggets (10 pieces)</td>
<td>24</td>
</tr>
<tr>
<td>Beef soft taco without cheese</td>
<td>8</td>
</tr>
<tr>
<td>Beef taco, regular style, without cheese</td>
<td>7</td>
</tr>
<tr>
<td>Bean burrito, no cheese</td>
<td>8</td>
</tr>
<tr>
<td>Taco salad with ground beef, no cheese</td>
<td>39</td>
</tr>
</tbody>
</table>

1. How many grams of total fat are in a quarter-pound hamburger? ___________

2. How many grams of total fat are in a regular hamburger? ___________

3. Circle the food with less fat:
   - Taco salad OR Beef soft taco
   - Bean burrito OR Fried fish filet sandwich
   - Crispy fried chicken OR Hamburger

4. List three ways you can make lowfat choices when you’re eating out.
   1. _________________________________________________________________
   2. _________________________________________________________________
   3. _________________________________________________________________

(USDA, 2008)
**Where's the Fat? Answer Key**

### Popular Fast Foods

<table>
<thead>
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<td>8</td>
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<td>Beef taco, regular style, without cheese</td>
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</tr>
<tr>
<td>Bean burrito, no cheese</td>
<td>8</td>
</tr>
<tr>
<td>Taco salad with ground beef, no cheese</td>
<td>39</td>
</tr>
</tbody>
</table>

1. How many grams of total fat are in a quarter-pound hamburger? *Answer: 18 grams*

2. How many grams of total fat are in a regular hamburger? *Answer: 9 grams*

3. Circle the food with less fat:

   - Taco salad
   - Beef soft taco
   - Bean burrito
   - Crispy fried chicken
   - Hamburger

4. List three ways you can make lowfat choices when you're eating out.

   1. Choose grilled *(not fried)*
   2. Choose the smaller size *(hamburger versus the quarter-pound hamburger)*
   3. Look at nutrition information provided by the restaurant before making your selection.

(USDA, 2008)
My Pyramid Level 3 Lesson 3
Lesson 3: Get Your Calcium-Rich Foods

Activity: What’s on the Label?

Make the following points about the health benefits of calcium-rich foods:

- Diets that are rich in lowfat and fat-free milk and milk products help build and maintain bone mass.
- Students their age especially need to drink milk, because this is when their bone mass is being built.

New pass out What’s on the Label? handout. Tell students that food labels give them important information about the nutritional value of the food. Discuss the following information with the students:

- Ask students to look for the words “Serving Size” on the labels. In the case of milk, the serving size is 8 fluid ounces = 1 cup.
- Next, have students find first the number of calories in a single serving of the food. Each of the first four labels is for an 8 fluid ounces glass of milk; yet they have a very different number of calories per serving. Why? Because of the fat and sugar content. Look at the calorie content for 1% chocolate milk. It is higher than the calorie content for whole milk. The extra calories come from sugar and chocolate.
- At the bottom of the food label, students will find some numbers followed by percent signs. This is where calcium is listed. Use the % Daily Value (DV) column when possible: 5% DV or less is low, 20% DV or more is high.

Pass out the What’s the Score? worksheet. Have students complete the chart at the top of the page, filling in numbers from the four nutrition labels for milk. Later, check students’ answers.

Next, have students use What’s on the Label? to help them complete the questions on What’s the Score? Check student answers and discuss.

(USDA, 2008)
What’s on the Label?

### Milk fat-free

<table>
<thead>
<tr>
<th>Nutritional Information</th>
<th>Amount Per Serving</th>
<th>% Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>32</td>
<td>0%</td>
</tr>
<tr>
<td>Total Fat</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>&lt; 5 mg</td>
<td>0%</td>
</tr>
<tr>
<td>Sodium</td>
<td>130 mg</td>
<td>5%</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>12 g</td>
<td>5%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Sugars</td>
<td>12 g</td>
<td>0%</td>
</tr>
<tr>
<td>Protein</td>
<td>8 g</td>
<td>0%</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>10 %</td>
<td>0%</td>
</tr>
<tr>
<td>Calcium</td>
<td>10 %</td>
<td>0%</td>
</tr>
</tbody>
</table>
| *Percent Daily Values are based on a 2,000 calorie diet.*

### Milk 1%, chocolate

<table>
<thead>
<tr>
<th>Nutritional Information</th>
<th>Amount Per Serving</th>
<th>% Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>170</td>
<td>7%</td>
</tr>
<tr>
<td>Total Fat</td>
<td>4 g</td>
<td>8%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>1 g</td>
<td>5%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>6 mg</td>
<td>2%</td>
</tr>
<tr>
<td>Sodium</td>
<td>120 mg</td>
<td>5%</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>25 g</td>
<td>9%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>1 g</td>
<td>0%</td>
</tr>
<tr>
<td>Sugars</td>
<td>12 g</td>
<td>0%</td>
</tr>
<tr>
<td>Protein</td>
<td>8 g</td>
<td>0%</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>10 %</td>
<td>0%</td>
</tr>
<tr>
<td>Calcium</td>
<td>10 %</td>
<td>0%</td>
</tr>
</tbody>
</table>
| *Percent Daily Values are based on a 2,000 calorie diet.*

### Milk 2%

<table>
<thead>
<tr>
<th>Nutritional Information</th>
<th>Amount Per Serving</th>
<th>% Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>120</td>
<td>6%</td>
</tr>
<tr>
<td>Total Fat</td>
<td>3 g</td>
<td>15%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>3 g</td>
<td>15%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>8 mg</td>
<td>5%</td>
</tr>
<tr>
<td>Sodium</td>
<td>130 mg</td>
<td>5%</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>13 g</td>
<td>5%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Sugars</td>
<td>12 g</td>
<td>0%</td>
</tr>
<tr>
<td>Protein</td>
<td>8 g</td>
<td>0%</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>10 %</td>
<td>0%</td>
</tr>
<tr>
<td>Calcium</td>
<td>10 %</td>
<td>0%</td>
</tr>
</tbody>
</table>
| *Percent Daily Values are based on a 2,000 calorie diet.*

### Milk whole

<table>
<thead>
<tr>
<th>Nutritional Information</th>
<th>Amount Per Serving</th>
<th>% Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>150</td>
<td>7%</td>
</tr>
<tr>
<td>Total Fat</td>
<td>6 g</td>
<td>10%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>6 g</td>
<td>25%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>12 mg</td>
<td>5%</td>
</tr>
<tr>
<td>Sodium</td>
<td>150 mg</td>
<td>5%</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>25 g</td>
<td>8%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>4 g</td>
<td>0%</td>
</tr>
<tr>
<td>Sugars</td>
<td>18 g</td>
<td>0%</td>
</tr>
<tr>
<td>Protein</td>
<td>8 g</td>
<td>0%</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>10 %</td>
<td>0%</td>
</tr>
<tr>
<td>Calcium</td>
<td>10 %</td>
<td>0%</td>
</tr>
</tbody>
</table>
| *Percent Daily Values are based on a 2,000 calorie diet.*

### Vanilla ice cream

<table>
<thead>
<tr>
<th>Nutritional Information</th>
<th>Amount Per Serving</th>
<th>% Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>190</td>
<td>8%</td>
</tr>
<tr>
<td>Total Fat</td>
<td>10 g</td>
<td>0%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>4 g</td>
<td>20%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>15 mg</td>
<td>0%</td>
</tr>
<tr>
<td>Sodium</td>
<td>190 mg</td>
<td>8%</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>13 g</td>
<td>5%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Sugars</td>
<td>15 g</td>
<td>0%</td>
</tr>
<tr>
<td>Protein</td>
<td>3 g</td>
<td>0%</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>10 %</td>
<td>0%</td>
</tr>
<tr>
<td>Calcium</td>
<td>10 %</td>
<td>0%</td>
</tr>
</tbody>
</table>
| *Percent Daily Values are based on a 2,000 calorie diet.*

### American cheese

<table>
<thead>
<tr>
<th>Nutritional Information</th>
<th>Amount Per Serving</th>
<th>% Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>60</td>
<td>3%</td>
</tr>
<tr>
<td>Total Fat</td>
<td>4 g</td>
<td>7%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>2 g</td>
<td>13%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>9 mg</td>
<td>1%</td>
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<tr>
<td>Sodium</td>
<td>250 mg</td>
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<td>Total Carbohydrate</td>
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<td>Dietary Fiber</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Sugars</td>
<td>9 g</td>
<td>0%</td>
</tr>
<tr>
<td>Protein</td>
<td>3 g</td>
<td>0%</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>10 %</td>
<td>0%</td>
</tr>
<tr>
<td>Calcium</td>
<td>10 %</td>
<td>0%</td>
</tr>
</tbody>
</table>
| *Percent Daily Values are based on a 2,000 calorie diet.*

### Fruit-flavored yogurt

<table>
<thead>
<tr>
<th>Nutritional Information</th>
<th>Amount Per Serving</th>
<th>% Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>170</td>
<td>7%</td>
</tr>
<tr>
<td>Total Fat</td>
<td>1 g</td>
<td>2%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>1 g</td>
<td>6%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>10 mg</td>
<td>1%</td>
</tr>
<tr>
<td>Sodium</td>
<td>150 mg</td>
<td>5%</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>22 g</td>
<td>7%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Sugars</td>
<td>10 g</td>
<td>0%</td>
</tr>
<tr>
<td>Protein</td>
<td>8 g</td>
<td>0%</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>10 %</td>
<td>0%</td>
</tr>
<tr>
<td>Calcium</td>
<td>10 %</td>
<td>0%</td>
</tr>
</tbody>
</table>
| *Percent Daily Values are based on a 2,000 calorie diet.*

### Cottage cheese

<table>
<thead>
<tr>
<th>Nutritional Information</th>
<th>Amount Per Serving</th>
<th>% Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>90</td>
<td>4%</td>
</tr>
<tr>
<td>Total Fat</td>
<td>2 g</td>
<td>4%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>1 g</td>
<td>6%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0 g</td>
<td>0%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>15 mg</td>
<td>2%</td>
</tr>
<tr>
<td>Sodium</td>
<td>410 mg</td>
<td>17%</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>4 g</td>
<td>1%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>3 g</td>
<td>0%</td>
</tr>
<tr>
<td>Sugars</td>
<td>8 g</td>
<td>0%</td>
</tr>
<tr>
<td>Protein</td>
<td>11 g</td>
<td>0%</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>10 %</td>
<td>0%</td>
</tr>
<tr>
<td>Calcium</td>
<td>10 %</td>
<td>0%</td>
</tr>
</tbody>
</table>
| *Percent Daily Values are based on a 2,000 calorie diet.*
What's the Score?

Here is a way to compare foods to see which foods are the best choices for you. Answer the questions below for these four foods, using What's on the Label?

<table>
<thead>
<tr>
<th></th>
<th>Fat-free milk</th>
<th>1% chocolate milk</th>
<th>2% milk</th>
<th>Whole milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the serving size for this item?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Is the serving size realistic? (Is this how much you would normally eat/drink?)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. How many total calories in one serving?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. How many total grams of fat in one serving?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. What percent of calcium in one serving?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on this information, which type of milk offers the most calcium with the lowest fat?

Now look at all the labels on the page. Answer these questions:

1. If Manuel drinks 8 fluid ounces of 1% chocolate milk and eats 6 ounces of fruit-flavored yogurt, how much calcium has he had?

   How many grams of fat?

2. Which food item on the sheet has the least calcium with the highest amount of fat?

3. Which food item on the sheet has the most calcium with the lowest amount of fat?
# What's the Score? Answer Key

Here is a way to compare foods to see which foods are the best choices for you. Answer the questions below for these four foods, using *What's on the Label?*

<table>
<thead>
<tr>
<th></th>
<th>Fat-free milk</th>
<th>1% chocolate milk</th>
<th>2% milk</th>
<th>Whole milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the serving size for this item?</td>
<td>1 cup (8 fl oz)</td>
<td>1 cup (8 fl oz)</td>
<td>1 cup (8 fl oz)</td>
<td>1 cup (8 fl oz)</td>
</tr>
<tr>
<td>2. Is the serving size realistic? (Is this how much you would normally eat/drink?)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. How many calories in one serving?</td>
<td>90</td>
<td>170</td>
<td>130</td>
<td>150</td>
</tr>
<tr>
<td>4. How many total grams of fat in one serving?</td>
<td>0</td>
<td>2.5</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>5. What percentage of calcium in one serving?</td>
<td>30% DV</td>
<td>30% DV</td>
<td>30% DV</td>
<td>30% DV</td>
</tr>
</tbody>
</table>

Based on this information, which type of milk offers the most calcium with the lowest fat?

Answer: Fat-free

Now look at all the labels on the page. Answer these questions:

1. If Manuel drinks 8 fluid ounces of 1% chocolate milk and eats 6 ounces of fruit-flavored yogurt, how much calcium has he had?  
   Answer: 50% DV

   How many grams of fat?  Answer: 4 grams

2. Which food item on the sheet has the least calcium with the highest amount of fat?  
   Answer: Vanilla ice cream

3. Which food item on the sheet has the most calcium with the lowest amount of fat?  
   Answer: Fat-free milk

(USDA, 2008)
Girls BMI Growth Chart
(About Pediatrics, 2008)
Boys BMI Growth Chart
# 2 to 20 years: Boys
Body mass index-for-age percentiles

<table>
<thead>
<tr>
<th>Date</th>
<th>Age</th>
<th>Weight</th>
<th>Stature</th>
<th>BMI</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*To Calculate BMI: Weight (kg) = Stature (cm) - Stature (cm) x 10,000

(About Pediatrics, 2008)
Exercise Preference Profile
Preference Profile

Each item contains two choices, A and B. Choose the one that you like best.

1. A. I enjoy playing video or computer games.
   B. I enjoy biking or running.

2. A. I enjoy playing volleyball or basketball.
   B. I enjoy sitting quietly and reading.

3. A. I like to sit and talk with my friends.
   B. I like to play or be physically active with my friends.

4. A. I like physical activities that make me sweat.
   B. I like activities that do not make me sweat.

5. A. I like to sit and talk with my family.
   B. I like to go outside with my family and play sports or be active.

6. A. I prefer to bike or play.
   B. I prefer to sit and eat ice cream.

7. A. I like to shop.
   B. I like to play sports.

8. A. I like to watch television.
   B. I like to play or be physically active.

9. A. I prefer to stay in bed a little longer in the morning.
   B. I prefer to get up and play or do sports.
Exercise Preference Score
Scoring Instructions for the Adolescent Preference Profile

Score 1 point for each of the following choices:
1A, 2B, 3A, 4B, 5A, 6B, 7A, 8A, 9A

The higher the score, the more likely immediate competing sedentary activity preference will interfere with moderate or vigorous activity.

A negative correlation will be anticipated between competing preferences and exercise behavior.

Five to seven day test-retest reliability on 8-11 year-old boys and girls – r = 0.89

(Pender, 2007)
Exercise Contract
I, ________________________, pledge to exercise at least _______ minutes per day.

Sign________________________________________ Date__________________

I will exercise by participating in my favorite activities.

Here are my top 5 ideas to exercise. (Circle 5)

Recess          Running         Playing Tag         Basketball
Soccer          Volleyball       Dancing         Hip-Hop
Gymnastics     Tumbling         Swim             Jump Rope
Stretching      Bicycling        Rollerblading         Skating
Yoga           Kick ball

OR Write in you own activities…

_____________________________________________________________
_____________________________________________________________
_____________________________________________________________

I promise that I will not participate in any activity that may be dangerous without adult supervision. I will also monitor my asthma, and stop any activity and find an adult, if I am having trouble breathing.

Sign________________________________________ Date__________________

(Austin, J., 2008)
REFERENCES


Murphy, M. & Polivka, B. Parental perceptions of the schools' role in addressing childhood obesity. Journal of School Nursing. 2007 Feb; 23(1): 40-6


