

USE OF STANDARDS OF CARE BY NURSE PRACTITIONERS IN PROVIDING  
CARE TO ADOLESCENTS WITH ASTHMA AT AN ACADEMIC NURSE-  
MANAGED PRIMARY CARE CLINIC

by

Wendy Renee Thal

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## DEDICATION

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## ABSTRACT

Asthma is a chronic disease that affects 8.4 million children in the United States (American Lung Association [ALA], 2007). Adolescents with asthma need tailored management of their care with attention given to particular developmental concerns. Standards of care, such as the National Heart, Lung, Blood Institute [NHLBI] 2007 asthma guidelines (NHLBI, 2007), exist to guide patient care and in this case, also address specific adolescent needs. Advanced practice nurses should incorporate “national standards of care as a framework for managing patient care” (American Association of Nurse Practitioners [AANP], 2007, p. 2). There is a lack of research about nurse practitioner use of standards of care, especially in caring for adolescents with asthma.

The purpose of this practice inquiry was to explore patterns of practice and perceptions of practice by the nurse practitioners who care for adolescents with asthma, and to evaluate the current patterns of practice in comparison with national standards for providing care to adolescents with asthma at the Larry Combest Community Health Wellness Center [LCCHWC]. The design for this practice inquiry was descriptive retrospective, using mixed methods for process evaluation of a program through description of nurse practitioner practice at an academic nurse-managed primary care clinic.

The nurse practitioners addressed all components of the process of care recommended by the AANP (2007), which includes assessment, diagnosis, development and implementation of a treatment plan, and evaluation of the patient status. However, despite comments about the importance of using evidence based practice in the form of guidelines, results from health records review indicate that nurse practitioners have not fully integrated the NHLBI 2007 asthma guidelines into providing care to adolescents with asthma. This study establishes a baseline

measure of adoption of the NHLBI 2007 asthma guidelines by nurse practitioners at this clinic site. The results of this study may ultimately contribute to nurse practitioners' awareness of use of standards of care and improved quality of care for adolescents with asthma.

## CHAPTER I: INTRODUCTION

Chapter I provides an introduction to the practice inquiry, beginning with the background and significance of the problem. Significance of the study to nursing is discussed, including relationship of the study to the author's particular area of interest. This chapter concludes with the purpose of the practice inquiry, specific aims, and definition of terms.

### Background

Asthma is a chronic disease process associated with bronchoconstriction and airflow limitation in the lungs. Airway reactivity is characteristic of asthma at all ages. Airflow obstruction usually resolves either spontaneously or with treatment. Inflammation causes an increase in airway responsiveness to a variety of stimuli, such as infection, environment, and stress. Both acute and chronic airway inflammation mechanisms lead to bronchial hyper responsiveness. During the acute reaction, bronchoconstriction occurs with airway edema and mucus secretion. Mast cells release cytokines that are responsible for entry of white blood cells, which sets up conditions for the late phase reaction. This inflammatory reaction may last for 4-24 hours (Husain & Kumar, 2005; Letz & Jain, 2007; Schuman, 2005). Airway remodeling (i.e., the restructuring of airways in response to inflammation), makes early diagnosis and intervention critical to achieve optimal outcomes (Letz & Jain, 2007). Asthma varies from no obvious symptoms to a life threatening event. Symptoms of asthma include shortness of breath, wheezing, chest tightness, and non-productive cough (Letz & Jain, 2007; Schuman, 2005).

The economic burdens in 2007 related to asthma included \$14.7 billion in hospital care, physician services, and medications, with another \$5 billion attributed to morbidity and mortality accounting for a total cost in the US of \$19.7 billion dollars. Approximately 12.8 million school days are lost each year in children under 18 years of age (ALA, 2007), contributing to lost

opportunity for learning and social development, which are critical to the needs of the adolescent (Vessey & Mebane, 2000).

### Statement of the Problem

#### *Prevalence*

The ALA (2007) reports that in 2006, an estimated 34.1 million Americans had been diagnosed with asthma in their lifetime. Of these, 8.4 million children between the ages of 5 and 17 years had been diagnosed with asthma in their lifetime. This report showed prevalence rates 20% higher in African-Americans compared to Non-Hispanic whites, while prevalence rates were lowest among the Hispanic population.

Prevalence among all children in Texas was 7.3%, with the highest prevalence among 10-14 year olds at 9.1% (Texas Behavioral Risk Factor Surveillance Survey as cited in Texas Asthma Control Program, 2007). A report on prevalence rates by ethnicity for this age group was not available. Health Services Region 1 is one of the health service regions of the Texas Department of State Health Services [TDSHS] serving the State of Texas. Health Service Region 1 serves 41 counties in the Panhandle and West Texas region (TDSHS, 2009). In 2005, Health Service Region 1 of Texas, which includes the geographical location of the practice site for this study, showed a prevalence rate of 12% among children ages 0-17 years. Race and ethnicity for this population was 60.4% White, 31.9% Hispanic, and 5.7% African-American (TDSHS, 2006).

A study conducted at Texas Tech University Health Sciences Center in Lubbock, Texas, during the fall of 2001, revealed an increased prevalence of children with asthma in the West Texas region compared to children with asthma nationwide (Arif, Borders, Patterson, Rohrer, & Xu, 2004). This prevalence was highest among the 11-16 year old population. The authors reported that over the last two decades this prevalence rate increased more than 75%. These data

reflect the significance of asthma for the health of children within the United States, and the state of Texas in particular. Results of the Arif et al. (2004) study showed a prevalence of asthma among children of West Texas at approximately 15% based on age adjusted to the US projected 2000 standard population. The study was conducted in the South Plains Pan Handle region of Texas, which is largely rural, with only 3 of 42 counties having populations greater than 50,000. This area closely corresponds to the geographic area of Health Services Region 1 in Texas.

The population in the Arif et al. (2004) study was of mixed ethnicity: Non-Hispanic White (61%), Mexican-American (32%), and Non-Hispanic Black (4%). Approximately 40% of this population reported an income of below \$30,000. Results from this study showed a higher prevalence of asthma among urban, non-Hispanic black children, who generally had increased morbidity and increased asthma hospitalizations when compared to Non-Hispanic white children. Environmental and demographic factors identified by the Arif et al. (2004) study included residing in urban areas, black ethnicity, obesity, exposure to allergens, and exposure to indoor and outdoor pollutants and to tobacco smoke.

Demographic data from the Larry Combest Community Health and Wellness Center (LCCHWC) showed that in 2007 there was a 43.6% Hispanic and 19.5% African-American population with more than half of the service area population falling below 200% of the poverty level. There were more than 17,000 children ages 0-17 years living in this service area who had limited access to health care. Almost 33% of the families in this area spoke a language other than English at home (US Census 2000 as cited in Texas Tech University Health Sciences Center & Combest Health and Wellness Center Community Alliance, 2007).

In 2002, the Centers for Disease Control and Prevention (CDC) conducted a National Health Interview Survey (NHIS) regarding a variety of health concerns for children under the

age of 18 years in the United States. This survey serves as a principal source for health information on the general population in the United States. In a summary of this report, Dey, Schiller and Tai (2004) state that children from lower income families are 16% more likely to have asthma than children from families with higher income. Children in a household headed by a single mother are also more likely to be diagnosed with asthma when compared to a two parent household. The authors found that non-Hispanic black children were twice as likely as Hispanic children to have had an asthma attack in the preceding 12 months. The Texas Asthma Control Program (2007) report reveals that asthma affects children more than any other chronic illness and that the burden of this disease falls more heavily on some populations.

Adolescents with asthma need tailored management of their care with attention given to identify particular developmental concerns. Standards of care, such as the National Heart, Lung, and Blood Institute 2007 asthma guidelines, exist to guide patient care and in this case, also address specific adolescent needs (NHLBI, 2007). While nurse practitioners incorporate “national standards of care as a framework for managing patient care” (AANP, 2007, p. 2), there is a lack of research about nurse practitioner use of standards of care, especially in caring for adolescents with asthma.

### *Population*

The vulnerable population for the study described in this report is composed of adolescents in West Texas that are living with asthma. There are many factors that predispose adolescents with asthma to being vulnerable. In addition to developmental age, attributes such as age, gender, chronic illness, mental illness, race, ethnicity, family structure and environment may place people at higher risk for vulnerability. A vulnerable population is at risk for “poor physical, psychological, or social health” (Aday, 2001, p. 2) and typically faces barriers when trying to



access timely and necessary health care. With the prevalence of vulnerable populations the provision of care is becoming inextricably intertwined with the nation's health and resources and there is a growing emphasis on equity within the system (Aday, 2001). Vulnerability can be similarly defined as "susceptibility to poor health" (Shi, 2001, p. 519; Shi & Stevens, 2005, p. 1). Shi focuses on vulnerable populations as those with minority status or ethnic backgrounds, low socioeconomic status (SES), and those without health insurance coverage.

Vulnerability does not reflect a lack of something intrinsic to the person, but rather the interaction of many risks over which the individual has little control. Using both the Aday (2001) and Shi and Stevens (2005) criteria, adolescents are considered vulnerable because of their stage of development. An adolescent with asthma may feel powerless to manage the disease process without family or peer support, yet want the independence found in self-efficacy. Adolescents with asthma are less likely than adults to maintain a regimen of preventative asthma health management (Price, 1996).

The "No Symptoms, No Asthma" beliefs identified by Halm, Mora and Leventhal (2006) may reinforce the concept that asthma medications are only needed during an acute asthma attack. Halm et al. (2006) conducted a study to characterize beliefs about the chronic nature of asthma. While the study population was adults, the results are relevant for the adolescent population. The authors surmised that understanding of the chronicity of asthma may be of great importance in a patient's adherence to therapeutic treatment regimen and self-management behaviors. Over half of the adults in this study reported believing that asthma is an acute episodic process existing only when they were symptomatic. Many parents have the belief that the child may one day outgrow their asthma, and the child may accept these beliefs as well. Adolescents may also have a poor understanding of asthma symptoms and may be uncomfortable discussing

their illness with their health care provider (Price, 1996). This poor understanding of asthma may place the adolescent with asthma at greater risk for adverse health outcomes.

Price (1996) describes adolescence as a “disagreeable period of turmoil, awkwardness, rebelliousness, and unpredictability” (Price, 1996, p. S13). Adolescence is the stage of life in which humans mature both physically and psychologically and begin to develop a sense of personal identity. Physically adolescents have acceleration in growth, usually reaching their maximum height by age 18-20 years. Genetics, health status, environment, and nutrition influence growth. It is also during this time that both primary and secondary sexual characteristics mature. Erikson (1963) describes adolescence as ages 12 to 20 years. During this time frame, the central task of adolescent is to develop identity versus role confusion. Development shifts from what is done to us, to what we ourselves do. Life becomes more complex as the adolescent separates from the family and establishes a personal philosophy of life. Part of this psychological development involves reliance on peers in learning roles and acculturation. Becoming autonomous is critical to the adolescent, to learn to make decisions and choices that will influence adult life (Berman, Snyder, Kozier, & Erb, 2008). The adolescent must not only develop independence, but also decrease dependency on family while at the same time developing strong personal ties to peers (Price, 1996). By developing a concept of self that acknowledges both strengths and weaknesses, the adolescent is able to establish a sense of identity and move forward into the next stage of development as a young adult (Berman et al., 2008).

During the teenage years, Piaget’s (1966) formal operations stage of cognitive development occurs. The adolescent begins to think outside the box, seeing what possibilities exist and strategizing ways to achieve those goals. Thinking becomes more organized, with

increased ability to think abstractly (Piaget, 1966). The ability to absorb new information and communicate also expands during these years. While primary health risks relate to risk taking behaviors, chronic illnesses such as asthma can significantly impact the adolescent. Teenagers with chronic illnesses are especially vulnerable, as adolescents can be cliquish and cruel to those they perceive as different from themselves (Berman et al., 2008).

Chronic health conditions such as asthma add another dimension to elements related to growth and development and to behavioral risk in the adolescent. A diagnosis of asthma may lead to strong emotions such as anger, denial, or decreased self esteem (Price, 1996). Children with asthma may have a physiological delay in puberty regardless of degree of illness or medications use (Price, 1996; Vessey & Mebane, 2000). Children with asthma may also have a developmental delay based on limitations such as inability to participate in group sports or social experiences and because of days lost from school (Kieckhefer & Ratcliff, 2000). Peer support is critical to support self-esteem in adolescents. The ability to share coping skills with peers with similar illness concerns also promotes self-esteem. Adolescents have a decided aversion to being perceived as different from their friends and this may contribute to non-compliance with their plan of care (Price, 1996). Because adolescents are aspiring to become independent and autonomous in their personal care, they can become overwhelmed with asthma and develop depression or despair or even unrealistic expectations for the disease process. Chronic disease contributes to a persistent reliance on parents because of a shared management of the disease process (Price, 1996). Because of being in a formal operation stage of behavior as defined by Piaget (1966), an adolescent can see illness as complex, and the caregiver needs to acknowledge the adolescent's behavioral and emotional response to disease. Even in a mild state of disease, the adolescent may experience significant developmental concerns because a caregiver or

provider may ignore problems, which can interfere with symptom recognition and disease management. If a caregiver treats an adolescent as unwell, the adolescent may be more likely to interpret their illness based on the caregiver perception than on their own feelings of wellness (Vessey & Mebane, 2000). Price (1996) states “Adolescent asthmatic patients are a distinct group of patients with different treatment requirements from either pediatric or adult patients” (Price, 1996, p. S17).

### Significance to Nursing Practice

In 1995, the NHLBI stated that a great challenge in controlling asthma is in reaching minority populations, which have some of the highest prevalence rates, emergency room use, and hospitalizations in the nation. Today, 15 years later, this remains a challenge. Minorities must overcome obstacles related to poverty, lack of access to care, language barriers, while managing challenges in reconciling “culturally based beliefs about health and illness” (NHLBI, 1995, p. 1) with those of health care providers.

This topic is significant to nurse practitioners, especially those providing care to adolescents who have asthma in medically underserved areas. The nurse practitioner “establishes evidence-based, mutually acceptable, cost awareness plan of care that maximizes health potential” (AANP, 2007, p. 2). This statement also serves as a definition of the standards of care for nurse practitioners. A standard of care is the “norm” by which a typical, careful provider would practice within a given community (Burns & Grove, 2007). Evidence based practice, which leads to development of strong standards of care, is the answer. DiCenso, Ciliska and Guyatt (DiCenso et al., 2005, p. 4) define evidence-based practice as “the best research evidence with clinical expertise and patient values” that is reflected in clinical decision making. Evidence-based practice (EBP) is a process for establishing knowledge on how to practice, based on

empirical evidence. Evidence-based practice is a critical concept in the development of nursing as a profession (Avis & Freshwater, 2006, p. 216). There is debate among health care professionals that EBP “overemphasizes” scientific evidence while “underplaying the role of clinical judgment and individual nursing expertise.” Knowing how to practice is a combination of science and experience, which can lead to “Thoughtful Practice” (Decker, 2007). The phenomenon of thoughtful practice depicts the intricate relationships of the critical and reflective thinking that leads to safe, competent patient care (Decker, 2007).

Clinical expertise involves the synthesis, dissemination, and use of research in the practice setting (Burns & Grove, 2007). In the complex health care system of today, there is an explosion of knowledge regarding disease process and treatment options. The information flow is overwhelming for an individual provider to assimilate and apply in a consistent manner to patient care. Evidence based practice is the integration of the highest level of research, clinical expertise and patient preference in determining a plan of care for a patient with a specific disease process (DiCenso et al., 2005). The use of evidence-based practice requires a hierarchy of data to determine “methodologically sound, clinically relevant research” (Burns & Grove, 2007, p. 4). Nurse practitioners, as expert clinicians, should be involved in the development process of evidence-based guidelines from conceptualization through implementation.

While national organizations urge use of standards of care in health care practice, providers may have difficulty determining the current state of evidence. There is often a time lag between the generation of the knowledge and its translation into practice. While the Institute of Medicine (IOM) (IOM, 2007) recommends that decisions that affect health care should be grounded in a trustworthy evidence base, IOM also recognizes that poor dissemination of the evidence is a challenge for providers. This organization identifies a need for more practice based

research “in which the experience of health care diagnosis and treatment is routinely captured in order to better care for those in the future” (IOM, 2007, p. 5). To best meet the needs of individual patients, standards are necessary to ensure safe, reliable quality care.

According to Rytton, Grant, Little and Gilsenan (2007), it is the responsibility of all health care providers to remain up to date on the newest developments to assure that patients receive the best care possible. A poster presented at the annual meeting of the American Academy of Asthma, Allergy and Immunology (AAAAI) in 2009, indicated that the national asthma guidelines are rarely followed, especially in patients with moderate to severe asthma (as cited in Kerr, 2009). The researchers, using a claims analysis from approximately 4000 patients, found that only 13.8% of the patients received step up care that followed the NHLBI 2007 guidelines (Kerr, 2009). Of great interest in this practice inquiry is the adoption of these national asthma guidelines by nurse practitioners, especially in providing care to adolescents with asthma, who are at risk, not just because of vulnerability of social status, ethnicity or minority status, but also because of their developmental age.

The NHLBI (2007) report contains key points in providing care for youth ages 12 years to adult. The PRACTALL initiative, endorsed by both the American Academy of Allergy, Asthma and Immunology and the European Academy of Allergy and Clinical Immunology, focuses exclusively on pediatric asthma and also recommends special considerations for adolescents with asthma (Bacharier et al., 2008). Considerations include direct involvement of the adolescent in establishing goals and plan of care (Bachierier et al., 2008; NHLBI, 2007). Adolescents are reluctant to use daily medications and do not like restrictions placed on their usual activities. This lack of adherence to treatment plans is associated with poor asthma outcomes (Bacharier et al., 2008; Price, 1996). Goals of care should be to reduce impairment and

reduce risk once control of asthma is established (NHLBI, 2007). While it is tempting to consider adolescents as similar to adults, pulmonary function norms compare more closely to childhood values. Pharmacological treatment of asthma for adolescents follows the same principles as for adults, though school and social development need consideration. Health care providers should provide education in an environment conducive to learning within the clinic setting, and should conduct a careful review of the asthma action plan, medications, and self-management behaviors at each follow up visit (Bacharier et al., 2008; NHLBI, 2007). It is clear from these recommendations that providers should take care to use age specific guidelines when implementing a standard of care.

In order for nurse practitioners to successfully incorporate standards of care into practice the information must first be made available. Roger's Theory of Diffusion of Innovation (Rogers, 2003) addresses the process of using research and communication of the ideas developed through research. Nursing has used the theory of diffusion of innovation successfully to promote dissemination of research findings (Burns & Grove, 2007). The diffusion of innovation theory served as a framework for this study and is further discussed in Chapter II.

#### Relationship to Advanced Practice Nursing (APN) Practice

Lubbock, Texas, is a city located in the heart of West Texas, with a population of roughly 260,000 people. Approximately 31% of this population is of Hispanic background. The average yearly income reported in 2008 for this city was \$39,000, which is below the national average (Lubbock Economic Development, 2008). The LCCHWC is an academic nurse-managed center. This clinic has a growing pediatric population and is located in a building on a public school ground in a medically underserved area of the city.

There were 2092 patients served in fiscal year 2007 at the LCCHWC. During this same time frame, demographics at this clinic site showed 59% of the patients were Hispanic and 12% were African-American. At least 63% of the patient population was considered poor, living below the 200% federal poverty level. Many of the patients were state insured, with 23% having Medicaid, 17% Medicare, and 35% considered self-pay, as they lacked health insurance of any sort. Almost 30% of the patients were children ages 0-17 years of age. In spring, 2009, the LCCHWC received Federally Qualified Health Center (FQHC) status, which clinic administrators anticipate will increase the volume of vulnerable patients seen at the clinic. Projected full operational capacity for fiscal year 2010 is expected to be at 4553 patients (Texas Tech University Health Sciences Center & Combest Health and Wellness Center Community Alliance, 2007).

Nurse practitioners at the clinic provide primary care to the clinic patients, and serve as faculty with the Texas Tech University Health Sciences Center Anita Thigpen Perry School of Nursing (TTUHSCATPSON). While there are two full-time and one part-time nurse practitioner at the clinic, other nurse practitioners use this clinic setting to maintain their faculty practice and see patients on a varying schedule. The nurse practitioners have differing degrees of education and experience, which can lead to variation in care practices.

Nurse practitioners should use both the scientific process and national standards of care in meeting health care needs of patients (AANP, 2007). Currently there are no officially accepted clinical practice guidelines to focus provider care on the special needs of the adolescent with asthma at LCCHWC. Texas Tech University Health Sciences Center recommends use of published guidelines as standards of care for specific problems when these are available (Brown, 2009).



The school of nursing mission is to improve the health of people by providing “quality educational programs and advance excellence in health care for diverse populations through programs of scholarship, research, practice, and service” (Texas Tech University Health Sciences Center Anita Thigpen Perry School of Nursing, n.d.a.). The mission statement philosophically guided this practice inquiry to advance asthma care in a diverse population of adolescents with asthma. Knowledge obtained from this study can strengthen practice behaviors in using age appropriate standards of care when interacting with adolescents with asthma, and can lead to improved outcomes for adolescents with asthma.

### Purpose

The purpose of this practice inquiry was to explore patterns of practice and perceptions of practice by the nurse practitioners who care for adolescents with asthma, and to evaluate the current patterns of practice in comparison with national standards for providing care to adolescents with asthma at LCCHWC. Questions guiding this inquiry were: (a) To what extent do the patterns of practice reflect adoption of an innovation, the NHLBI 2007 asthma guidelines, by the LCCHWC nurse practitioners in providing care for adolescents with asthma; and, (b) What are the perceptions of the LCCHWC nurse practitioners regarding their own adoption of an innovation, the NHLBI 2007 asthma guidelines, for their nursing practice, in providing care for adolescents with asthma.

### Definition of Terms

- **Patterns of Practice:** The process of care recommended by the AANP (2007), which includes assessment of health status, diagnosis, development of a treatment plan, implementation of the plan, and evaluation of the patient status.

- Adoption: Use of the innovation at least 70% of the time during interaction with adolescents with asthma in the clinic setting, as documented in health records.
- Innovation: The NHLBI 2007 asthma recommendations for adolescents, which is the national standard of care.
- Perception: Opinions of nurse practitioners at LCCHWC reflected in responses to the Nurse Practitioner Survey and semi-structured Interview Guide questions on patterns of practice by nurse practitioners.
- LCCHWC Nurse Practitioners: Registered nurses with advanced education and clinical competency to provide health care for diverse population using scientific process and national standards of care.
- Adolescents with asthma: Male and female patients of LCCHWC who were 12 to 20 years of age at the time of their documented visits to the LCCHWC and who had been previously diagnosed with asthma or were diagnosed at the time of the documented visit.

### Summary

In summary, this chapter introduced the purpose of study, which was an exploration of patterns of practice among nurse practitioners providing care to adolescents with asthma at an academic nurse managed center, and a comparison of these practice patterns to a national standard of care. The theory of diffusion of innovation as the framework for this study is discussed further in the following chapters. The importance of standards of care in providing care to a vulnerable population such as adolescents with asthma is supported through a review of literature in the next chapter.

## CHAPTER II: CONCEPTUAL FRAMEWORK AND REVIEW OF LITERATURE

This chapter is a description of the conceptual framework and review of literature for this practice inquiry. The conceptual framework includes major concepts guiding this study. The review of literature explores vulnerabilities of adolescents with asthma and supports the importance of use of standards of care in treating adolescents with asthma.

### Conceptual Model

Theory is a “conceptualization of the phenomenon of interest” (Kazdin, 2003, p. 124). Theory serves as a framework and guides the interpretation of relationships among the study variables. Kazdin states that the goal of research is to “understand” a process and that theory provides the underpinnings necessary to bring together “multiple variables and processes” (Kazdin, 2003, p. 129). The diffusion of innovation theory, also known simply as diffusion theory, is the conceptual framework adopted for this practice inquiry.

Diffusion theory derives from “a body of research that has attempted to identify predictable patterns of program adoption and diffusion by a variety of population groups and across a broad range of innovations” (Oldenburg & Parcel, 2002, p. 317). Rogers (Rogers, 2003, p. 5) defines diffusion as a “process in which an innovation is communicated through certain channels over a period of time among the members of a social system.” An innovation is an idea or practice that is new to the individual or an organization. According to Rimer and Glanz (2005), this theory addresses the mechanism of how innovations spread from one society to another. Diffusion of innovation theory at its heart relates to the dissemination of knowledge. For purposes of this study, the new National Heart, Lung, and Blood Institute (NHLBI) 2007 guidelines for asthma care as applied to adolescents is the innovation.

During communication, the source of the innovation transfers the message through a channel to the receiver. For this study, the source of the innovation is the NHLBI, which falls under the umbrella of the National Institute of Health. Communication channels are necessary to transmit the knowledge from person to person. This sharing of knowledge can be via mass media or face to face (Rogers, 2003). The communication channel, in this case, can be the NHLBI website, professional conferences, professional journals, or other channels. The receiver is the health care provider, who can then apply this information in a patient care setting (Figure 1). Simply publishing a guideline, however, does not always translate into a change in practice behaviors (Prior, Guerin & Grimmer-Somers, 2008). This study addressed adoption of the national asthma guidelines by nurse practitioners providing care for adolescents with asthma.

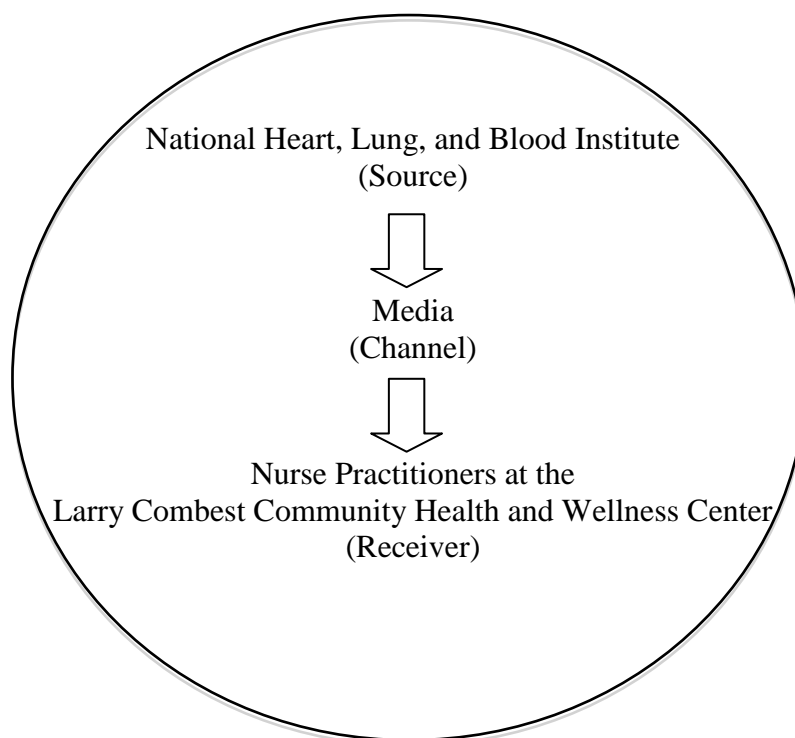


FIGURE 1: Adoption of Asthma Knowledge

### *Stages of Dissemination in the Diffusion of Innovation Theory Pertaining to Asthma*

There are five stages in the dissemination process: knowledge, persuasion, decision, implementation, confirmation (Rimer & Glanz, 2005; Rogers, 2003). These stages are sequential in nature and are based on needs, reflecting both characteristics of the individuals and perceived characteristics of the innovation itself (Rogers, 2003).

#### *Knowledge*

The first stage of dissemination, knowledge, occurs when individuals or organizations are exposed to new information and gain understanding (Rimer & Glanz, 2005; Rogers, 2003). The NHLBI first announced major revisions for comprehensive asthma care in the fall of 2007. The revised guideline soon appeared as summaries for health care providers by way of professional conferences and media. While some providers may prefer to obtain new information through peer reviewed journals, others may prefer the interpersonal touch of attending seminars at professional conferences or in discussions with colleagues at the clinic. Nurse practitioners at the LCCHWC might have had varying levels of experience with the NHLBI 2007 asthma guidelines.

#### *Persuasion*

In the second stage of dissemination, persuasion, individuals form either favorable or not favorable opinions about the new knowledge (Rimer & Glanz, 2005; Rogers, 2003).

Interpersonal communication is most effective during the persuasion stage. As peers discuss this information, a positive or negative attitude towards the innovation is developed.

#### *Decision*

During the third stage of dissemination, decision, individuals choose to adopt or not to adopt the new information (Rimer & Glanz, 2005; Rogers, 2003). Choice may be dependent

upon the level of evidence available, the rationale for choosing the treatment option, and nurse practitioner perception of the ability of patients to comply with the treatment plan, or patient preference.

### *Implementation*

During implementation of dissemination, the fourth stage of dissemination, the new knowledge is incorporated into daily practice habits and becomes routine (Rimer & Glanz, 2005; Rogers, 2003). Possible benefits of implementing guidelines include a decrease in inappropriate care, increased clinical efficiency, and better control of health outcomes (Prior et al., 2008). Personal characteristics of the providers such as awareness of the asthma guidelines and familiarity with the content may impact implementation of guidelines in the clinical setting (Francke, Smit, de Veer & Mistianen, 2008).

### *Confirmation*

In the last stage of the dissemination process, confirmation, knowledge is integrated into practice and the individual encourages use of the information among others (Rimer & Glanz, 2005; Rogers, 2003). Practitioners are acculturated to the change in practice and may carry out the new behavior seamlessly. It is during the confirmation stage that integration of knowledge into practice by the nurse practitioners at the LCCHWC would occur.

### *Innovation of Asthma Knowledge*

The innovation explored in this study was the revised NHLBI 2007 asthma guidelines, also known as the Expert Panel Report-3 (EPR-3). These guidelines stem from the National Institute of Health's National Asthma Education and Prevention Program, housed within the National Heart, Lung, and Blood Institute. The goal of EPR-3 is to improve asthma care and quality of life for all asthma patients by putting evidenced-based information into the hands of

practitioners, thereby, reducing morbidity and mortality. The NHLBI 2007 asthma guidelines are a revision of past practice guidelines and incorporate emerging evidence and new pharmacotherapeutics that were not available in the previous two versions.

Shaneyfelt and Centor (2009) suggest centralization of clinical practice guideline (CPG) development to reduce bias and the redundancy of multiple guidelines. They suggest that the US Department of Health and Human Services is the most appropriate agency and reliable source for supporting guideline development. This is the oversight agency for the asthma national guidelines. The US Department of Health & Human Services describes the EPR-3 as a clinical practice guideline (NHLBI, 2007). Development of this CPG involved a thorough evaluation of available literature, including systematic reviews, Cochrane reviews, randomized clinical trials, case studies, previous consensus statements, and other known best practices. Experts with experience in the clinical problem of interest then graded the CPG, using best rules of evidence to form expert opinions. By looking at both the “quality of the available evidence” and “strength of the clinical recommendation” (NHLBI, 2007, p. 2), health care providers anticipate that the expected outcomes will ensue. Guidelines should be flexible to allow for tailoring to individual patient needs. As such, CPGs help clinicians and patients make decisions about suitable health care (IOM, 2008).

The IOM (2008) describes key attributes necessary to determine whether these guidelines can be considered trustworthy and of the necessary strength to meet the needs of both provider and patient. These attributes include objectivity, transparency, efficiency and timeliness, external review, currency, and overlaps and gaps. Objectivity ensures that the expert panel has minimal bias and that the clinical guidance is trustworthy. Transparency encourages public participation and requires that panel members disclose conflicts of interest. Efficiency and timeliness ensure

responsiveness to both the patient and provider needs at the point of care. An external review by outside experts and allowing public input on development of the guidelines ensure quality of the CPG. Currency implies the constant monitoring necessary to keep guidelines up to date (IOM, 2008). Most CPGs become outdated after five years and lack a formal mechanism for updating, so guidelines must have an evaluation process in place as evidence changes quickly (Shaneyfelt & Centor, 2009). Overlaps and gaps in guidelines can occur with conflict between the sponsoring groups (IOM, 2008). A mechanism to reconcile overlaps and gaps between groups should exist. The NHLBI 2007 asthma guideline satisfies the criteria and key attributes outlined by the IOM for inclusion into a CPG. CPGs help providers improve clinical practice, quality of care, and subsequently patient outcomes (Francke et al., 2008).

#### *Adoption of Asthma Knowledge*

The rate by which adoption of an innovation occurs can be explained by five attributes within the diffusion of innovation theory. These are relative advantage, compatibility, complexity, trialability, and observability (Rimer & Glanz, 2005; Rogers, 2003).

#### *Relative Advantage*

Relative advantage is the degree to which an innovation is perceived as superior to previous ideas (Rimer & Glanz, 2005; Rogers, 2003). Individuals may base this perception on benefit to self, or “what is in it for me.” Because the latest guidelines are based on the best evidence available, the author anticipated that the nurse practitioners at the LCCHWC would perceive this as a relative advantage when providing best practice to adolescents with asthma.

#### *Compatibility*

Compatibility exists when new information is consistent with the existing values, experience and needs of adopters (Rimer & Glanz, 2005; Rogers, 2003). Individuals determine



compatibility when considering congruency with their internal values. The TTUHSCATPSON mission statement espouses advanced excellence in health care for diverse populations and adherence to the highest standards of quality in practice settings (TTUHSCATPSON, n.d.a.). Because the nurse practitioners providing care at this clinic setting were also faculty at the TTUHSCATPSON, there was probability of a high degree of compatibility of values and beliefs in using the guidelines advocated by the NHLBI to meet the needs of the adolescent population with asthma.

### *Complexity*

Complexity is the ease of use of the new idea and the difficulty inherent in understanding the innovation, as potential adopters may perceive these factors (Rimer & Glanz, 2005; Rogers, 2003). Health care providers considering adoption of a new protocol prefer uncomplicated language and ease of use. Characteristics of the guidelines affect provider use. The standard of care within the NHLBI guidelines provides clear, concise definitions of terms and allows for measurement of treatment outcomes. The report provides references for instruments and other tools to decrease complexity in following the national guidelines.

### *Trialability*

Trialability is the extent to which an idea can be used on a limited basis, allowing users to try out the new idea before full adoption occurs. If an idea or innovation can be trialed first it is more likely to be adopted (Rimer & Glanz, 2005; Rogers, 2003). Health care providers may implement guidelines that are easier to understand and trial more quickly (Francke et al., 2008). In some instances, the guidelines may need to be customized to the clinic population to increase provider buy in. Nurse practitioners at the LCCHWC might have used a trial of selected portions of the national asthma guidelines before fully adopting the new guidelines.

### *Observability*

Observability is defined as the degree in which ideas are observed and communicated among other people (Rimer & Glanz, 2005; Rogers, 2003). Peer pressure and professional dialogue may increase the rate of adoption when desired outcomes are evident. Does this innovation produce visible results? Observability would be the ability to see visible outcomes for the adolescent with asthma receiving care based on the national guidelines.

### *Other Factors*

Other factors that impact adoption of new ideas are personal characteristics, organizational characteristics, and environmental characteristics (Francke et al., 2008). Personal characteristics such as level of education, years in practice, and degree of comfort with the patient population can influence decisions in adopting a guideline. Organizational characteristics reflect an ability to facilitate implementation of culturally specific adolescent asthma guidelines. An environment that values the use of evidence based practice has administrative support, adequate resources, an effective communication system, and will be more likely to achieve a successful adoption of the clinical practice guideline than an environment that does not value these qualities. Environmental characteristics such as peer support and available time for providers to learn new guidelines may also impact implementation of guidelines in the clinical setting (Francke et al., 2008).

### Review of Literature

A literature search using multiple search databases was conducted and not limited by discipline, year of publication, or type of research. A general evidence-based search was performed via The University of Arizona Health Science Library EBM link and the Texas Tech University Health Sciences Center library database in the summer of 2008 and updated in April

and August 2009. Database searches included Medline, PubMed, and Cinahl. Relevant articles were chosen from 2003-2009. Search terms are available in Appendix A.

There is a hierarchy of levels of appropriate resources for evidence based nursing. Articles chosen for this review were from the top three tiers of the evidence based pyramid as described by the Arizona Health Sciences Library EBM search engine (Arizona Health Sciences Library, 2008). Relevant articles include clinical guidelines, systematic reviews, meta-analysis, and randomized controlled trials. Pertinent descriptive studies are included. A second search produced articles based on references reported in previously read articles and included dates from 2000-2009. There was some duplication of results produced by these searches. This review of literature addresses the perception and use of standards of care by health care providers and the AANP standards of care as applied within the context of the four components of the NHLBI 2007 asthma guidelines. The four components are measures of asthma assessment and monitoring, education for a partnership in asthma care, control of environmental factors and co-morbid conditions that affect asthma, and medications (NHLBI, 2007).

#### *Use of Standards of Care*

The IOM (2003) defines disparities in health care as differences in the quality of care due to the operation of the health care system or differences due to discrimination. Differences in the quality of asthma care may result from differences in the process of providing care, based on the degree to which providers apply accepted standards of care (Cabana, Lara, & Shannon, 2007). Adolescents with asthma need individualized their care with attention given to identify particular developmental concerns. Standards of care, such as the NHLBI asthma guidelines, guide patient care and, in this case, also address specific adolescent needs. While nurse practitioners use standards of care for managing patient care” (AANP, 2007), “little is known about APRNs and

their practice patterns” (Burns & Grove, 2007, p. 293). Because there is minimal literature available on advanced practice nurses’ perceptions and use of standards of care, this literature review focused on health care providers and their perceptions and use of standards of care.

*Perceptions and Use of Standards of Care by Health Care Providers*

Ring, Malcolm, Coull, Murphy-Black, and Watterson (2005) conducted a descriptive study using qualitative methods to explore implementation of the first five Best Practice Statements (BPS) among nurses in the United Kingdom. Best Practice Statements were designed to reduce variations in patient care by using evidence based practice guidelines. Fifteen nurses involved in implementing BPS participated in semi-structured interviews via telephone. Using content analysis, the investigators discovered four main themes from the interview transcripts. These were variations in BPS use, patient benefits, practitioner benefits, and barriers and drivers to use. The authors used quotations from the transcripts to support credibility of the data. Use of the BPS depended on current position of the participants, with the majority reporting at least partial use of the guidelines.

Participants perceived that benefits to patients were quality improvement and a “re-emphasis on fundamental aspects of care” (Ring et al., 2005, p. 1051). All participants reported a benefit to nurses by supporting consistent use of best practice and increased knowledge of clinical topics. While fewer participants (20%) reported that BPS helped change practice behaviors, and use of BPS promoted professional accountability (13%), the investigators reported these as significant based on the “powerful nature” (Ring et al., 2005, p. 1052) of the participant quotes. All participants reported barriers to use of BPS. These included lack of resources, lack of training, resistance to change, and not seeing guideline as a priority for care. Participants made suggestions to propel future use of the BPS guidelines. These include

additional resources, improved dissemination of the guidelines, and feedback on performance, specifically the use of benchmarking to identify where changes should occur.

Barriers discussed in the Ring et al. (2005) study were similar to those found in a study by Profetto-McGrath, Bulmer Smith, Hugo, Taylor and El-Hajj (2007). These investigators conducted a qualitative pilot study to understand the “sources, nature, and application of evidence used by specialists in practice” (Profetto-McGrath et al., 2007, p. 87). The investigators used a descriptive, exploratory design to assess gaps in knowledge about evidence used by clinical nurse specialists from their own perspective. Seven clinical nurse specialists participated in individual semi-structured interviews that were audio taped and transcribed. The investigators coded the transcriptions by hand and presented results in a narrative format using sample quotations to support credibility of the data. The clinical nurse specialists perceived barriers to the use of evidence as a lack of time to seek out new evidence, resistance to changing current practice behaviors in the practice setting, and role confusion from staff about advanced practice nurses.

A recommendation from the clinical nurse specialists interviewed indicated “specific evidence delivery strategies to disseminate information” (Profetto-McGrath et al., 2007, p. 92) such as informal in-services, meetings, or journal clubs would facilitate the used of evidence in the practice setting. Facilitators to the use of evidence in practice were peer support, access to information, clinical experience, and administrative support.

Physicians recognize that evidence based guidelines are the preferred treatment for many patients but are aware that it may not provide all the answers for all patients, according to a study by Hay et al. (2008). This qualitative study explored physician opinions on clinical decision making and evidence farming, which incorporates local experience into evidence-based practice.

A sample of 39 participants used focus groups and individual interviews to explore physician views. The authors presented results in a narrative format and did not provide statistical data in the report. The physicians noted that guideline implementation may not be possible due to patient resources or environment. Physicians reported that experience is central to the decision making process and that health care decisions may be made based on “providing patients with the best possible care within given restraints” (Hay et al. ,2008, p. 710).

Grover et al. (2007) conducted a study to investigate gaps between national guidelines and physician practice patterns in a primary care practice. They used a retrospective medical record review to record presence or absence of documentation. The authors did not discuss validation of the data collection instrument. A total of 68 patients met the inclusion criteria for the study. The authors noted that use of an electronic documentation tool for recording urinary tract infection patient visits improved documentation rates for some aspects of the health history (87% for those using the tool versus 41% for those not using the tool). The authors reported that residents were more likely to use the tool than the attending physicians (28% vs. 9%). Results indicated that, of patients with an uncomplicated urinary tract infection, less than 25% received treatment as outlined in the national guidelines. The authors recommended use of a prompted template to serve as a guide for improved documentation and educational interventions to improve physician practice patterns.

Martin (2008) conducted a descriptive study to determine influences on family nurse practitioner (FNP) students’ use of the Seventh Report of the Joint National Commission on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC-7) hypertension guidelines (NHLBI, 2003) within a classroom assignment as part of a clinical practicum. The investigator posed inquiry questions to determine if student FNPs used evidence based guidelines

in caring for patients with hypertension and what barriers and facilitators were found to influence the use of the evidence-based guideline in clinical decision making. Martin developed a data collection instrument for the study based on the JNC-7 hypertension guidelines and collected both demographic and multiple choice survey data. The FNP students documented information on decision making during the clinical experience. The students also identified information on barriers and facilitators to use of the guidelines. Eleven students took part in this study, with 55 patient encounters noted. The students obtained demographic data, health status, and co-morbidities on the patients.

Martin (2008) found that 56% of the students stated they used the JNC-7 guidelines, but this was not supported by the students' plan of care. Reasons for variation in plans of care were attributed to numerous factors, including site, patient populations, preceptor practice patterns, health care economics, and patient co-morbidities. Students identified preceptors as both barriers and facilitators impacting guideline implementation. Students identified patient need as the rationale for decision making the majority of the time and preceptor pressure as the second most influential in determining patient management. The JNC-7 guidelines themselves were reported as the third highest influence on student clinical decision making. Other factors impacting decisions to use the JNC-7 hypertension guidelines were personal preference, access to care, lifestyle choices of the patient, and cost, including the cost in time for health care providers to implement the guidelines (Martin, 2008).

Experts in the study of evidence based practice acknowledge there is minimal knowledge about the relationship between what nurses know and believe about EBP "and the extent to which their practice is evidence-based" (Melnyk et al., 2004, p. 186). These experts undertook a descriptive study to explore nurses' knowledge and beliefs about EBP, to determine the extent

their practice is based on evidence, and the relationship among these variables. A convenience sample of 160 nurses from four states attending an EBP conference completed a validated survey developed to address these issues. The investigators used descriptive statistics to answer the study questions. A total of 46% of the participants indicated that their current practice was evidence-based.

Barriers to EBP implementation in the Melnyk et al. (2004) study included lack of time, lack of access to resources, lack of financial support, and need for mentors. Facilitators to EBP were faculty, clinical nurse specialists, nurse practitioners, library resources, administrators, and peer support. Nurses who felt strongly about EBP improving patient outcomes or improving clinical care showed a positive correlation with a higher use of EBP ( $r = .32, p < .001$ ;  $r = .40, p < .001$ ). Having greater knowledge about EBP positively correlated to a higher use of EBP and to a current involvement in EBP initiative ( $r = .42, p < .0001$ ;  $r = .34, p < .001$ ). The investigators found a positive correlation between length of time in practice as an APN and knowledge of EBP ( $r = .37; p < .001$ ). There was a positive correlation between greater use of Cochrane Database of Systematic Reviews or use of the <http://www.guideline.gov> website use of evidence-based practice ( $r = .43, p < .003$ ;  $r = .41, p < .001$ ). The investigators also found that nurses having a stronger belief that research evidence improves patient outcomes perceived fewer barriers to the use of EBP ( $r = -.27, p < .05$ ). The presence of a mentor positively correlated with higher levels of knowledge ( $r = .28, p < .003$ ) while nurses having a mentor that supported EBP reported “more extensive” (Melnyk et al., 2004, p. 190) application of evidence-based practices ( $r = .21, p < .05$ ).

Results of these studies were valuable for the purpose of this practice inquiry as the researcher explored perceptions of nurse practitioners in the use of national asthma guidelines. In



summary, common threads that prohibit the use of evidence-based practice guidelines are lack of resources such as time or money to research best evidence, resistance to change in the clinical setting by health care providers (Martin, 2008; Melnyk et al., 2004; Profetto-McGrath et al., 2007; Ring et al., 2005), and limitations of patient resources (Hay et al., 2008; and Martin, 2008). Facilitators to promote use of evidence based practice in the clinical setting include improved dissemination of evidence based practice (Grover et al., 2007; Profetto-McGrath et al., 2007; Ring et al., 2005), administrative and peer support (Melnyk et al., 2004; Profetto-McGrath et al., 2007; Ring et al., 2005), and impact of mentors (Melnyk et al., 2004).

#### *Application of Asthma Standards of Care*

The National Heart, Lung, and Blood Institute organized the 2007 asthma recommendation in four components: measures of asthma assessment and monitoring, education for a partnership in asthma care, control of environmental factors and co-morbid conditions that affect asthma, and pharmacologic therapy (NHLBI, 2007). These four components frame the discussion of the AANP standards of care: assessment of health status, diagnosis, development of a treatment plan, implementation of the plan, and evaluation of the patient status (Figure 2).

#### *Assessment and Diagnosis*

The NHLBI 2007 asthma guideline component one, measures of assessment and monitoring, and component three, control of factors that contribute to asthma severity are discussed under the AANP standards of care: assessment of health status and diagnosis. The NHLBI 2007 asthma recommendations include the need to tailor care to meet the needs of the individual patients. Providers need to consider the patient's knowledge and belief about asthma, communication, developmental concerns, and cultural and ethnic considerations. Providers should identify both caregiver and child preferences in care and identify possible barriers to care

while maintaining sensitivity to cultural beliefs (NHLBI, 2007). This section of the review of literature addresses barriers to care, language barriers, health beliefs and family characteristics, peer and social support, and assessment of self-management behaviors relevant to care of adolescent patients.

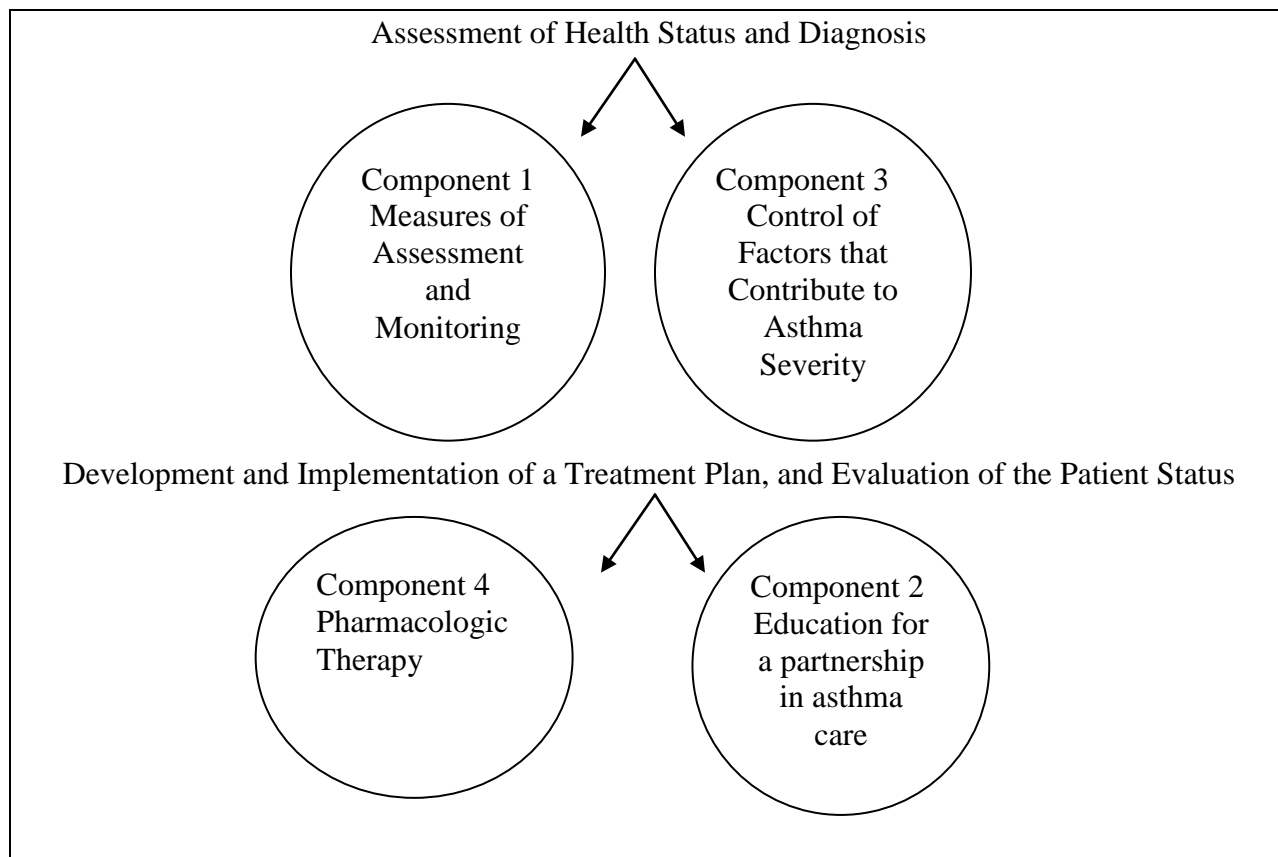


FIGURE 2: Patterns of Practice Reflected Through the Process of Care (AANP, 2007; NHLBI, 2007)

### *Barriers to Care*

Inkelas, Garro, McQuaid and Ortega (2008) conducted a study to evaluate the association between race, ethnicity, language, and processes of asthma care for children from 0 to 17 years of age. This four state survey of California, Texas, Illinois, and Alabama used data from the National Asthma Survey. The researchers found that only 41% of children in this study had an

asthma management plan and that overall experience with asthma did not follow the national guidelines. Of special concern in the Inkelas et al. (2008) study was that Latino children had poorer asthma process of care than white children. Latino children from Spanish speaking households had “poorer process with care” (Inkelas et al., 2008, p. 123) than white children for being taught what to do during an asthma exacerbation ( $OR = 0.4$ ,  $CI\ 95\% = 0.2 - 0.6$ ) and on being advised to change the child’s home or school environment to avoid triggers ( $OR = 0.5$ ,  $CI\ 95\% = 0.3 - 0.8$ ). This is relevant for this practice inquiry as there is a large Hispanic patient population at the primary clinic site. These findings are similar to those of other studies (McQuaid, Walders, Kopel, Fritz, & Klinnert, 2005; Ortega et al., 2002). Differences in “process of care” (Inkelas et al., 2008, p. 124) rather than access to care may contribute to observed differences.

Seid (2008) studied the extent to which barriers to care explain variance in primary care experiences beyond that explained by “financial, potential, and realized access to care” (Seid, 2008, p. 995). This investigation was part of a randomized trial of problem solving skills training conducted primarily from Federally Qualified Health Centers in California. Among the 252 families recruited, the author found that better access to care related to better primary care experiences, based on parental perceptions of the primary care experience. These results are consistent with the national asthma guidelines that stress the importance of longitudinal asthma care, which leads to better outcomes. This information may be of great importance, given the new Federally Qualified Health Center status as the LCCHWC and the efforts to improve access to care.

McQuaid, Walders, Kopel, Fritz and Klinnert (2005) in a descriptive study involving 115 children 7-17 years of age found evidence to suggest that barriers to effective asthma

management may relate more to socioeconomic status than to cultural factors ( $p < 0.001$ ). These authors recommend interventions targeting low income families to improve family based asthma management skills. Numerous other authors have reported that rates of hospitalization and emergency department use for asthma are higher for low-income and minority children (Berg & Wahlgen et al., 2004; Canino et al., 2006; Dey, Schiller & Tai, 2004; Ortega et al., 2002).

Overall, populations having minority status, low parental education, poverty, limited English ability, lack of insurance, no usual source of care, and having other unmet health needs are more vulnerable to poor health outcomes (Aday, 2001; Canino et al., 2006; IOM, 2008; McDaniel, Paxson & Waldfogel, 2006; Seid, 2008; Shi, 2001).

### *Language Barriers*

Language barriers are also of great importance when considering the vulnerability of the pediatric population with asthma. In the Inkelas et al. (2008) study, evaluation of the association between language and process of care indicated possible language barriers in caring for families with limited English proficiency. Similarly, Halterman, Aligne, Auinger, McBride and Szilagyi (2000) in a cross sectional study involving 1025 children examined factors associated with inadequate asthma therapy and found that in Spanish speaking Latino families, children received inadequate asthma therapy 1.4 times more often than when English was the preferred language.

Brotanek, Halterman, Auinger and Weitzman (2005) investigated patterns of asthma morbidity and access to care for children with asthma from Spanish speaking and English speaking families. Measures of asthma morbidity included number of hospitalizations due to asthma and number of acute care visits for episodes of wheezing during the previous 12 months. The investigators assessed the number of times sleep was disturbed, usual activities were limited, and number of school or work days the child missed because of wheezing. Results showed that

children from Spanish speaking families were one third less likely to have a regular health care provider ( $OR = 0.31$ ,  $CI\ 95\% = 0.1-0.8$ ) than children from English speaking families. Being a Spanish speaking only family was associated with a decreased likelihood of having a regular health care provider.

Chan, Keeler, Schonlau, Rosen and Mangione-Smith (2005) also evaluated the effects of language barriers on management practices and outcomes in children and adolescents with asthma. The investigators used a descriptive study design as part of an evaluation of asthma interventions at 13 US clinics. The authors reported significant differences in the socioeconomic status among the four race/ethnicity and language groups that were studied. The four groups were white, African-American, Latino from Spanish speaking only homes, and Latino from English speaking homes. White parents had a higher income and education level compared with the parents in the African-American and Latino groups ( $p < .05$ ). More Latino children and adolescents from Spanish speaking homes were uninsured than in the other three groups studied. Latinos from Spanish speaking homes had lower rates of goal setting, peak flow monitoring and asthma monitoring, and more negative family impact, when compared with those in the white ethnic group ( $p < 0.05$ ). All other asthma management practices appeared similar for African-American, Latinos in English speaking homes, and white ethnic groups. Latinos from Spanish speaking homes had poorer quality of life and poorer management plans than those of Latinos in English speaking homes ( $p < 0.05$ ). Evidence from this study supports that language barriers appear to contribute to poorer asthma management practices and outcomes among Latino pediatric patients.

Chan et al. (2005) stated that a “linguistically and culturally tailored asthma education program” (Chan et al., 2005, p. 287) will increase asthma knowledge, decrease environmental

triggers, and increase controller use in Latino families with an asthmatic child. The NHLBI 2007 report acknowledges discrepancies in asthma care related to language barriers. This report recommends use of interpreters that are not just fluent in both English and the patient's language, but also have a strong knowledge base in medical terminology (NHLBI, 2007).

### *Health Beliefs and Family Characteristics*

Adolescent health beliefs and family characteristics impact health outcomes from asthma. Underlying cultural and health beliefs may create obstacles in adhering to asthma treatment plans. As discussed earlier, Halm et al. (2006) conducted a study to evaluate beliefs about the chronicity of disease in "a cohort of inner-city adults with persistent asthma" (Halm et al., 2006, p. 573). Study goals included characterization of patients' beliefs about whether asthma is an acute or chronic illness, and to characterize patients having the no symptoms, no asthma disease belief. The investigators also assessed associations between the no symptoms, no asthma belief model, medication adherence, and other self-management behaviors. Results from this study indicated that patients with an acute asthma flare as the disease state defined the time between flares as being "disease free." The authors termed this the "no symptoms, no asthma disease belief" (Halm et al., 2006, p. 574). Patients with the no symptom, no asthma belief felt they would not always have asthma and expected a cure. Because the common terminology for an unexpected acute episode is an "asthma attack," implying that asthma is not always present, this may reinforce the belief that the disease is not always present. Another concern found is that many parents anticipate that a child may outgrow the asthma, reinforcing the concept that asthma is not a chronic illness that continues into adult life. The authors concluded that a useful approach may be to tailor asthma interventions to an individual's belief about the disease process.

Knight (2005) conducted a study to identify “beliefs and self-care practices of adolescents with asthma” (Knight, 2005, p. 71). The study was based on the idea that values and personal beliefs influence health care behaviors that providers should incorporate these values and beliefs into patient education and intervention studies. Key points included adolescent beliefs about asthma, effects of these beliefs on medication use, avoidance of asthma triggers, and assessment of self care practices. She used a semi-structured questionnaire in conjunction with individual audio taped interviews. Data analysis revealed six identified themes.

The six identified themes were symptom recognition and knowledge acquisition, self efficacy, medication efficacy, feasibility of trigger avoidance, social support, and acceptance of the diagnosis of asthma. The author stated that knowledge acquisition was best when achieved with multiple educators, including family, a consistent health care provider, or other group programs. Knight reported high self-efficacy when the student described feelings that “exercise and trigger avoidance made a positive difference” (Knight, 2005, p. 76). Low self-efficacy occurred when the student had feelings of “limitations and fear” (Knight, 2005, p. 76). Medication efficacy increased if the student felt that using preventive medication “made a positive difference and compliance was high” (Knight, 2005, p. 77). The author stated that the student may recognize a “limited ability to control their environment” (Knight, 2005, p. 77). The author also found that better coping existed if “social supports encourage calm approach and accepting help from others” (Knight, 2005, p. 77). The author concluded that knowledge acquisition, self-efficacy, and social support are integral to obtaining better outcomes in adolescents with asthma. Results from this study are congruent with adolescent development as described by Price (1996), in that emphasis on peer support is critical for adolescents with

asthma to promote self esteem. The ability to share coping skills with peers with similar illness concerns also promotes self-efficacy and self-esteem.

Using adolescent health beliefs to facilitate knowledge acquisition will help strengthen the health status of the adolescent. In a study by Kyngas (2004) adolescents reported sometimes using their chronic illness as a means to get special attention at school such as an excused tardy or absence. According to van Es et al. (2002), adolescents tend to test boundaries by opposing expected behaviors in an effort to develop their own identity. Harmful behaviors, such as non-adherence to a medication regimen, may have greater appeal than complying with the treatment plan, despite knowing the implications for their health.

#### *Peer and Social Support*

Kyngas (2004) described “the support network of adolescents with a chronic disease from their own perspective” (Kyngas, 2004, p. 287). She found six main categories of support networks of adolescents with chronic disease; “parents, peers, health care providers, school, technology and pets” (Kyngas, 2004, p. 289). Participants emphasized the significance of discussion and active communication with parents as of great importance. Parents who used open discussion techniques made a more significant impact than those who focused on questions relating to the disease. Peers were also an important part of the support network. Peers with a chronic disease were perceived as having better understanding and greater support; however, those more severely ill had the potential to be non-supportive by being more negative, leading to depression. It was important that the fellow sufferer be of the same age for best support. Peers without a chronic disease were able to share feelings about other issues in addition to coping with the disease process (Kyngas, 2004).



Peer support is also a powerful tool in an asthma educational intervention program for adolescents. Having the opportunity to discuss concerns and share tips on asthma management also improves health outcomes (Price, 1996). While providers are integral to educating asthma patients about management of the disease process, other sources such as personal experience and peer groups may influence self-care behaviors (Chan et al., 2005). Adolescents with a chronic disease identify with others of similar nature. They may perceive that peers have better understanding and provide support and care. Peers with a similar disease process help relieve feelings of isolation. Ability to discuss asthma with peers can improve asthma self-management skills in adolescents (Kyngas, 2004; NHLBI, 2007).

#### *Assessment of Self-management Behaviors*

In a meta-analysis to assess the effectiveness of educational programs on self-management of asthma in 3706 patients, ages 2-18 years, Guevara, Wolf, Grum and Clark (2003) found a “modest to moderate” (Guevara et al., 2003, p. 5) improvement in lung function ( $MD = 0.50$ ,  $CI\ 95\% = 0.25 - 0.75$ ), self-efficacy ( $MD = 0.36$ ,  $CI\ 95\% = 0.15 - 0.57$ ), reduced absenteeism from school ( $MD = -0.14$ ,  $CI\ 95\% = -0.23 - -0.04$ ), reduced days of restricted activity ( $MD = -0.29$ ,  $CI\ 95\% = -0.33 - -0.09$ ), and number of visits to the emergency department ( $MD = -0.21$ ,  $CI\ 95\% = -0.33 - -0.09$ ), by incorporating knowledge, skills, and feelings of control into education programs. Similarly, these feelings of control were found by Kyngas (2003), who conducted a study to describe “patient education from the perspective of adolescents” (Kyngas, 2003, p. 744). She used a questionnaire to assess compliance, normality, provider support, parent and peer support, energy, willpower, motivation, and subjective experiences within the disease process. She used a semi-structured interview guide to obtain more focused information from adolescents. Results from this study indicated that while adolescents understood the need to

comprehend the disease, treatment, and self-care, there was a greater interest in learning how to cope with the disease and in how the disease is perceived by their peers. Adolescent preferences indicated a need for an active role and discussion within a well-planned patient educational program. Rhee, Ciurznski and Yoos (2008) also found that age appropriate interventions were necessary for adolescents to “facilitate optimum development” and to conform to “peer defined attitudes, values, and behaviors” (Rhee et al., 2008, p. 123). These findings are consistent with information found within both the PRACTALL report and the EPR-3 (Bacharier et al., 2008; NHLBI, 2007).

Berg, Tichacek and Theodorakis (2004) conducted a pilot study to evaluate the adolescent asthma education program known as Power Breathing™ Program. The purpose was to determine the effects this program would have on “general asthma knowledge, asthma triggers, and functional health status in a small group of adolescents” (Berg et al., 2004, p. 30). While a small sample size of 13 participants and use of self-report placed limitations on the study, several themes emerged from the results. The authors state that participants reported feelings of frustration concerning asthma and the feelings of misunderstanding by “themselves, their family, and friends concerning their illness” (Berg et al., 2004, p. 33). Results showed that the participants enjoyed the group approach and felt that the peer support within this setting helped in improving self-management skills. The authors stated that the adolescent might be at a greater risk for poor outcomes in management of asthma because of their developmental levels. The authors emphasized a need for asthma educational programs geared towards the adolescents, with an emphasis on peer group support.

### *Development, Implementation and Evaluation*

The AANP standards of care, development, implementation of a treatment plan and evaluation of patient status include ordering appropriate diagnostic tests, prescribing appropriate pharmacologic and non-pharmacologic interventions, and developing a developmentally appropriate education plan and referrals as necessary. The NHLBI 2007 asthma guideline component two, education for a partnership in asthma care and component four, pharmacologic therapy are discussed, using the AANP standards of care: development and implementation of a treatment plan, and evaluation of patient status.

Adolescents should be allowed input into any plan of care. The provider should tailor the plan of care to individualized needs of the adolescent and caregiver. The provider should evaluate adolescents' attitudes and beliefs about medications. Education should begin at diagnosis and be reinforced at every patient encounter (NHLBI, 2007). The importance of asthma education and use of medication, as they apply to care of adolescent patients is discussed in the next section.

### *Importance of Asthma Education*

Education is an integral part of providing care for an adolescent with asthma. Both the PRACTALL report and the NHLBI 2007 asthma guidelines report that lack of education regarding asthma and asthma self management has been associated with poor outcomes in adolescents with asthma (Bacharier et al., 2008; NHLBI, 2007). Adolescents are becoming more independent and, without the necessary knowledge and skills, are unable to assume responsibility for self-care. Adolescents may fail to recognize the danger of poorly controlled asthma and may not accept the diagnosis of chronic disease (NHLBI, 2007). Adolescents may be reluctant to use

a daily medication, resulting in poor compliance with use of preventive asthma medications (Bacharier et al., 2008).

Kyngas (2003) reported that adolescents perceived the environment of an educational program was important. Subjects preferred an encouraging atmosphere where they felt respected and motivated to become responsible for their care. They also preferred that the educator use language that they could understand. The adolescents preferred personalized written information and modern methods of teaching, such as use of the Internet. The author recommended assessing the adolescent's developmental stage and self-preferences for patient education prior to implementing an educational program.

Rance and Trent (2005) conducted a study to develop an asthma program to reduce asthma related emergency department visits, hospitalizations, and missed days of school, to improve medication adherence and reduce risk factors for death. The authors emphasized that asthma is a "condition that can be controlled, prevented, and need not contribute to limited activity" (Rance et al., 2005, p. 28). They created a "Triad of Treatment" as a theory for change and to allow replication for comparisons based on clinical findings. The triad included use of rescue medication, use of controller medication, and patient education. The investigators implemented a protocol pathway throughout the practice setting to standardize asthma care. At baseline, the 135 participants had a combined total of 256 asthma-related emergency department visits, 90 asthma-related hospitalizations, and 959 asthma-related missed school days. At follow up a year later, asthma-related emergency department visits were at 49 (a decrease of 82%), asthma-related hospitalizations were 8 (a decrease of 91%) and missed school days due to asthma were 385 (a decrease of 60%). The authors concluded that asthma can be managed using the triad approach.

Inkelas et al. (2008) emphasized a need for better asthma education. They recommended better implementation of the national asthma guidelines, especially in areas related to sensitivity to culture and improved education for the pediatric patient and family. Their teaching targeted an improved understanding of environmental triggers and self management of the disease process: in this study, education both increased the adolescents' knowledge about asthma and relieved their fears about their medications.

Shegog et al. (2001) conducted a prospective pretest/posttest randomized intervention to assess a computer assisted instructional program and to "evaluate the impact of the program in eliciting change in knowledge, self-efficacy, and attributions of children with asthma" (Shegog et al., 2001, p. 49). They found that use of the computer program captured the participants' attention and motivated them to remain engaged with the learning process. The use of computer based programs is culturally appropriate in asthma education for adolescents (NHLBI, 2007). Adolescents perceive technology as extremely important. When considering options in instructing adolescents, the use of technology is a viable alternative to teach adolescents appropriate asthma self- management skills (Kyngas, 2004; NHLBI, 2007). The NHLBI 2007 report suggests the use of computer based technology when implementing asthma management programs in the adolescent population.

Age appropriate education in promoting proper use of medication and in preventing asthma related hospitalizations and missed days of school is important (Rance & Trent, 2005). However, Knight (2005) states that knowledge acquisition alone does not "improve asthma outcomes for children, especially in culturally diverse and lower income populations" (Knight, 2005, p. 72). Adolescent beliefs and values will impact self-management behaviors in any asthma educational intervention. Recommendations to improve outcomes for adolescents with

asthma include consistent asthma care and education as reflected within the national asthma standards of care (Berg et al., 2004). By using perspectives from adolescents regarding patient education, providers can improve adherence to treatment protocols and self management. Communication between the educator and patient can enhance lifestyle changes. This is particularly important when caring for patients with asthma who may “underestimate the severity” of the disease and “overestimate” the level of control they have over the disease (Kyngas, 2003, p. 746).

#### *Use of Medication*

Halterman et al. (2000) investigated medication use among US children with asthma and assessed for risk factors related to less than adequate therapy. The authors used data from the National Health and Nutrition Examination Survey (NHANES) III report from 1988-1994. Of the children diagnosed with moderate to severe asthma, only 26% had taken a maintenance medication in the preceding month. Factors associated with less than adequate therapy included younger than age 5 years ( $OR = 4.48$ ,  $CI\ 95\% = 1.59 - 12.64$ ), Medicaid insurance ( $OR = 4.78$ ,  $CI\ 95\% = 1.17 - 19.51$ ), and Spanish language ( $OR = 64.60$ ,  $CI\ 95\% = 9.19 - 454.00$ ). The authors noted that children surveyed after 1991, when the first national guidelines became available, were no more likely to receive maintenance medications than those surveyed before 1991. The authors concluded that under-medication is common among poor children with asthma. Children with Medicaid had lower rates of adequate treatment than children with private insurance, and children from Spanish speaking only families had less than adequate treatment overall.

In the Lieu et al. (2002) study, the investigators noted that black and Latino children were less likely to use controller medications than white children. In a follow up study in 2004, Lieu et

al. (2002) found in a sample of 1663 children insured by Medicaid that 65% were under-using preventive medications. Correspondingly, Finkelstein, Lozano, Farber, Miroshnik and Lieu (2002) showed that among Medicaid insured children, 73% were under-users of controller therapy with 49% no controller, and 24% with less than daily use. A multivariate model found that black ( $OR = 1.7$ ,  $CI\ 95\% = 1.2 - 2.4$ ) or Latino ( $OR = 2.2$ ,  $CI\ 95\% = 1.3 - 3.8$ ) race were associated with under-use and that parental education beyond high school was protective ( $OR = 0.6$ ,  $CI\ 95\% = 0.4 - 0.8$ ). The authors reported lower rates of under-use of medications when children had a primary care provider, written action plan, scheduled follow up visits, and involvement of an asthma specialist. Under-use was more common in children younger than 4 years (79%) and among adolescents (81%). Minorities and children with less educated parents were at higher risk for under use of controller medications, which is consistent with results of other studies (Farber et al., 2003; Halterman et al., 2000; Lozano, Finkelstein, Hecht, Shulruff, & Weiss, 2003; Lieu et al., 2002; Ortega et al., 2002). Finkelstein et al. (2003) recommended a structured proactive approach using national guidelines to improve outcomes in children with asthma.

A randomized controlled study was conducted by van Es, Nagelkerke, Colland, Sholten, and Bouter (2001) to assess the effects of an asthma education intervention on adherence to prescribed asthma medications by stimulating positive attitude, increasing feelings of social support, and enhancing self- efficacy among adolescents. At baseline there were no statistically significant differences for adherence, attitude, social influences, and self-efficacy. At the two year follow up, self-adherence was significantly higher in the experimental group when compared to the control group ( $M = 6.7$ ,  $SD = 2.3$ ). While healthy peers may establish independence, adolescents with a chronic illness had to rely more on caregiver support than their

peers. The results from this study “gave no answer to the question of whether peers are...of less influence than assumed” (van Es et al., 2001, p. 200). The authors stated that participants in the study may have noticed that peers within the group sessions did not take their medication regularly and this may have given a sense of support towards non-adherence (van Es et al., 2001). Adolescents should actively participate in health care decisions to improve both adherence to treatment plan and increase self-efficacy (Bacharier et al., 2008; NHLBI, 2007; Vessey & Mebane, 2000).

Conn, Halterman, Lynch and Cabana (2007) conducted a survey of parents of 622 children with asthma to “describe parents’ perceived need for and concerns about their child’s asthma medications” (Conn et al., 2007, p. e521), and to look at positive and negative beliefs in relation to parents reported adherence to their child’s medication. The authors were primarily interested in the relationship that existed between “the measured difference of parents’ beliefs about medications and parent reported medication adherence” (Conn et al., 2007, p. e522). Most of the participants were non-minority. In this study, 72% of parents felt that their child’s medications for asthma were necessary while 30% had concerns about the medications. The authors concluded that being a non-minority predicted a higher adherence to medications. This study indicates a need to understand how parent’s beliefs about asthma medications influence their decision to comply with child’s asthma management therapy and that providers should address parental concerns about adverse effects and effects of medication on growth.

### Summary

This chapter summarizes diffusion of innovations theory as the framework for this practice inquiry and the current state of the literature on health care providers’ use of standards of care and application of the NHLBI 2007 asthma guidelines in providing care to adolescents



with asthma. It is clear that culturally sensitive health care providers “who... provide the appropriate prevention education, intervention, and evidence-based treatment, can offset many of the disparities related to asthma morbidity” (Canino et al., 2006, p. 2934). This review of literature supports the need for quality care based on the highest levels of evidence to achieve best health outcomes for adolescents afflicted with asthma.

## CHAPTER III: METHODS

Chapter III details the inquiry design, setting, sample, protection of human subjects, data collection procedures, plan for data analysis, instrument development, timeline, budget, and limitations of the study. The chapter begins with a review of the practice inquiry purpose and the questions that guided this inquiry. The purpose of this inquiry was to explore patterns of practice and perceptions of practice by the nurse practitioners who care for adolescents with asthma, and to evaluate the current patterns of practice in comparison with national standards for providing care to adolescents with asthma at the Larry Combest Community Health and Wellness Center (LCCHWC). The inquiry questions were: (a) To what extent do the patterns of practice reflect adoption of an innovation (i.e., the NHLBI 2007 asthma guidelines) by the nurse practitioners at the LCCHWC when providing care to adolescents with asthma?; and (b) What are the perceptions of the nurse practitioners at the LCCHWC regarding their own adoption of the innovation (i.e., the NHLBI 2007 asthma guidelines) for their nursing practice in providing care for adolescents with asthma.

### Design

The design for this practice inquiry was descriptive retrospective, using mixed methods for process evaluation of a program through description of nurse practitioner practice. This design supports description of the characteristics of patterns of practice of nurse practitioners in caring for adolescents with asthma and a “picture of a situation as it naturally happens” (Burns & Grove, 2007, p. 240) and is useful to identify problems or justify current practice in a clinical setting. The researcher examined evidence of clinical practice of nurse practitioners at the LCCHWC in translating research into practice, by evaluating use of the NHLBI 2007 asthma guidelines when caring for adolescents with asthma. Experiential descriptions provide nurse

practitioners' perspective of the clinical application of evidence based practice (Simpson, Stevens & Kovach, 2007).

Rossi (2004) recommends use of process evaluation to determine whether treatment protocols are being followed. Demonstration that a "program is well implemented can be presumptive evidence that the expected outcomes are produced as well" (Rossi, 2004, p. 57). Advantages of process evaluation include gaining insight into the beginnings of the outcomes of interest, building theory that is responsible for obtaining that outcome, and enhancing generalizability of results to other settings or clinical practice guidelines. Knowledge of process can have a direct impact on the outcome of interest (Sidani & Braden, 1998). In order to explain the end results of patient care, nurse investigators must also understand the process used to implement that patient care. Burns and Grove (2007) state that "analysis of the process of making diagnosis and therapeutic decisions is critical to the evaluation of the quality of care" (Burns et al., 2007, p. 277). It is the expectation that by understanding the process of care, identified factors may facilitate adoption of national asthma guidelines and lead to improved health outcomes for adolescents with asthma. Both quantitative and qualitative data are useful in conducting process evaluation (Sidani & Braden, 1998).

### Setting

The LCCHWC is a non-profit, academic nurse managed primary care center operated by TTUHSCATPSON since 1998. The center serves a medically underserved population in the city of Lubbock, Texas (TTUHSCATPSON, n.d.b.). This clinic is on a public school ground leased from the Lubbock Independent School District. In spring, 2009, the LCCHWC received Federally Qualified Health Center (FQHC) status. During 2010, the projected number of people served at this clinic site will probably double from the number served in 2007 (Texas Tech

University Health Sciences Center & Combest Health and Wellness Center Community Alliance, 2007).

Staffing at the clinic consists of two full time nurse practitioners and seven faculty practice nurse practitioners, who provide care one day a week. In addition, there are two nurse practitioners associated with the LCCHWC through the Senior House Calls program. Other faculty practice nurse practitioners provide care on an as needed basis. Nurse practitioners provide a comprehensive range of services for all ages, including wellness exams, acute illness, minor injury, and chronic disease management.

### Sample

The sampling frame for this study had two components: a non-random convenience health record sample and a nurse practitioner sample, with each component providing data to answer the two inquiry questions. To answer inquiry question one, the health record sample provided data to describe nurse practitioner practice patterns as documented in health records of a sample of adolescents. To answer inquiry question two, the nurse practitioner sample, consisting of all who had provided care to patients, provided data through interviews to describe perceptions of the nurse practitioners regarding their own adoption of the NHLBI 2007 asthma guidelines.

#### *Inquiry Question 1 - Sample from Health Records*

Health records reflect provider practice in the care of the adolescent with asthma and are an appropriate data source for this type of study (Gearing, Mian, Barber, & Ickowicz, 2006; Worster, 2004). Health records for the retrospective health record review were from the electronic health record (EHR) system at the LCCHWC. Health records for the study contained International Classification of Diseases, Ninth Revision (ICD-9) codes most commonly used

with the diagnosis of asthma for the time period August 1, 2007 to August 1, 2009 (Skyscape, Inc., 2006). See Table 1 for ICD-9 codes chosen. The researcher chose all health records meeting inclusion criteria to evaluate the practice patterns of the attending nurse practitioners. Inclusion criteria were: health records of male or female adolescent, 12-20 years of age, with a documented diagnosis of asthma or diagnosed at the time of the documented visit. Exclusion criteria were: a significant respiratory illness at the time of the documented visit, such as pneumonia or influenza, disabilities, or chronic illness other than asthma. Health records with documentation by nurse practitioners involved in this practice inquiry as researcher or committee member were also excluded.

Advantages of using health records include low cost, ease of access to the population, and provision of both quantitative and qualitative data (Burns & Grove, 2007). A disadvantage in using health records is difficulty in generalizing to other populations because of differences in characteristics inherent in the participants and their clients in this study.

Demographic characteristics of the health record sample ( $N = 54$ ) yielded a profile similar to that of typical patients seen at the LCCHWC with the exception of the types of funding. Approximately half of the sample received state assisted insurance through CHIP ( $n = 26$ ), 37% were private pay ( $n = 20$ ) and the remainder had private insurance ( $n = 8$ ). No members of the health record sample received Medicaid benefits, though 23% of the patient population at the clinic has Medicaid (Texas Tech University Health Sciences Center & Combest Health and Wellness Center Community Alliance, 2007). The health record sample showed an even distribution of males and females. Approximately half of the sample was Hispanic ( $n = 26$ ), and 30% African-American ( $n = 18$ ) (See Table 2).

TABLE 1: ICD- 9 Codes for the Health Record Sample

ICD – Code	Disease or Health Related Problem
493.0	Extrinsic Asthma
493.1	Intrinsic Asthma
493.2	Chronic Obstructive Asthma
493.8	Other
493.81	Exercise Induced Bronchospasm
493.82	Cough Variant Asthma
493.92	Asthma Unspecified
786.07	Wheezing
786.09	Dyspnea
786.05	Shortness of Breath
786.2	Cough

TABLE 2: Health Record Sample Demographic Characteristics (N = 54% (n))

N = 54	% (n)
Gender	
Male	52 (28)
Female	48 (26)
Ethnicity	
Hispanic	48 (26)
African American	33 (18)
Unknown	11 (6)
Caucasian	7 (4)
Insurance	
CHIP	48 (26)
Private Pay	37 (20)
Private Insurance	15 (8)

### *Inquiry Question 2 - Sample*

The sample for the second inquiry question was a purposive sample of all nurse practitioners who had provided care to patients at the LCCHWC August 1, 2007 to August 1, 2009. Participation was voluntary. The researcher invited all nurse practitioners who had provided care to patients at the LCCHWC August 1, 2007 to August 1, 2009, to participate in interviews. Advantages and disadvantages of using this sample are the same as those for the retrospective health record review. A small sample is sufficient for this qualitative study, as the

purpose is not to test theory (Burns & Grove, 2007; Simpson et al., 2007). There were eight of nine nurse practitioners who chose to participate in the study, yielding an 89% response rate, which is a good an acceptable response.

The UNAG survey provided demographic characteristics of the sample. All providers were Caucasian and monolingual, English speaking only ( $N = 8$ ). The age range of nurse practitioners at the LCCHWC was 31 to over 50 years of age. Of the nurse practitioners, six were Master's prepared FNPs, two were doctorally prepared FNPs, with one of these nurse practitioners both FNP and PNP certified. The number of years in practice varied, with most having a nurse practitioner practice of over six years ( $n = 5$ ). Most had been in practice at the LCCHWC for 1-2 years ( $n = 5$ ), with others there from 3-5 years ( $n = 2$ ) and 6-10 years ( $n = 1$ ).

#### Protection of Human Subjects

The institutional review boards at The University of Arizona and Texas Tech University Health Sciences Center granted human subjects approval for this study (see Appendix B). The clinic director at the LCCHWC gave permission to use that site for this study (see Appendix C). Nurse practitioners at the LCCHWC provided informed consent for participation in this study (see Appendix D).

#### *Inquiry Question 1 - Protection of Human Subjects*

The electronic health record system used at the LCCHWC for the retrospective health record review is password protected. Access is limited to onsite or remote access using the password protected system. The password is specific to the researcher and is not shared with other personnel. The researcher manually extracted all de-identified data and stored it in a secured location within the researcher's locked office space, not using or disclosing information other than permitted according to human subject's approval. The HIPAA privacy regulations

were followed. The researcher did not collect identifiable age information but documented age as a range from 12-20 years of age, according to the inclusion criteria. Demographic data for the record review were gender, ethnicity, and type of insurance. The researcher held the research assistant entering data to SPSS in the inquiry to the same standards, restrictions, and conditions stated in the data use agreement with respect to the health information (Burns & Grove, 2007).

#### *Inquiry Question 2 - Protection of Human Subjects*

The researcher followed all HIPAA privacy regulations. The researcher explained the purpose of the study, reviewed personal qualifications to conduct the interview, and obtained informed consent from nurse practitioners that agreed to participate in the interview. The researcher also asked the nurse practitioners permission to audiotape interviews (Ring et al., 2005; Profetto-McGrath et al., 2007) and notified them that data were confidential and stored in a secure location in the locked office of the researcher (Ring et al., 2005) to be destroyed at the end of the study. For each participant there was a provider code to link informed consent with the corresponding recorded interview, which the researcher stored in a secure location in personal office space throughout the course of the study. The researcher held the transcriptionist assisting in the inquiry to the same standards, restrictions, and conditions stated in the data use agreement with respect to the health information. At the completion of the study, the researcher will destroy the code linking the participant with the recorded interview, delete the computer file listing which participant did which interview, and destroy the audiotapes by shredding.

#### Data Collection Procedures

##### *Inquiry Question 1 - Data Collection Procedures*

The electronic health record system at the LCCHWC provided the data base for health record data retrieved for this study. This type of study employs previously collected patient



information as the “primary source of information to answer a research question” (Worster, 2004, p. 187). The researcher obtained patient demographic information using the *Patient Demographics* section on the *Nurse Practitioner Use of Quality Indicators in Providing Care to Adolescents with Asthma* instrument (NPUQI) (see Appendix E). Data collection involved researcher review of all health records of adolescent patients with asthma seen in the clinic from August 1, 2007 through August 1, 2009.

Strengths of doing a retrospective health record review with electronic health records are that these records are easily searchable and less costly to search than other types of record reviews (Worster, 2004), and may have data with fewer errors. Because nurse practitioners enter data directly into the patient health record, this should reduce data entry process errors and strengthen “the quality of computerized data” (Worster, 2004, p. 189).

It is “ideal to evaluate the impact of evidence-based innovation using existing reliable data sources and measures, such as data already collected in a health care system” (Donaldson, Rutledge & Ashley, 2004 p. S44) including the use of documentation data. The use of “qualitative data often complement quantitative data” (Donaldson et al., 2004 p. S46) thereby strengthening information gained in the study.

#### *Inquiry Question 2 - Data Collection Procedures*

The researcher obtained provider demographic data on the nurse practitioner participants by using the *Provider Demographics* section on the *Perceptions of Nurse Practitioners on Use of National Asthma Guidelines in Providing Care to Adolescents with Asthma Survey and Semi-Structured Interview Guide* (UNAG) instrument, without provider identifiers (see Appendix F).

The researcher collected interview data using the UNAG (see Appendix F). This instrument has survey questions with multiple choice answers, followed by open-ended

questions, to elicit nurse practitioner responses about their experience in implementing national asthma guidelines in the care of adolescents with asthma. There was one interview with each participant, conducted in person at one interview session. The use of a single interviewer promotes consistency in the interview process (Insel, n.d.). The researcher gave a \$10 gift card for a local restaurant as gratuity for nurse practitioner participants.

### Data Analysis

Both quantitative and qualitative data analysis produced the results of this study. Quantitative data analysis, using descriptive statistics, determined the results for the first inquiry question. Qualitative content analysis produced the results for the second question. The researcher reported aggregate data to minimize vulnerability of the participants to being identified.

#### *Inquiry Question 1 - Data Analysis*

Analysis of data from the retrospective health record review produced frequencies and percentages of documented use of the chosen quality indicators and comparison of these results to the national asthma guidelines to determine to what extent practice patterns of the nurse practitioners indicate adoption of the asthma national guidelines (Sidani & Braden, 1998). The research assistant, guided by the researcher, entered all data into the Statistical Package for the Social Sciences (SPSS), Version 17.0 program for statistical evaluation. A consultation with a CITI trained biostatistician guided review of instrumentation and data analysis.

Rossi (2004) states that the most commonly used criterion to set desired levels to target achievement of an objective in process evaluation is to use “administrative standards” set by the program administrators (Rossi, 2004, p. 174). For this reason, the comparison at the 70% level of use of each quality indicator variable in this study indicated adoption, per the request of the

LCCHWC clinic director and in accordance with the previously established clinic continuous quality improvement benchmark (Larry Combest Community Health and Wellness Center, n.d.).

*Inquiry Question 2 - Qualitative Content Analysis*

Qualitative content analysis is the “analysis strategy of choice for a qualitative descriptive study” (Sandelowski, 2000, p. 338). In qualitative content analysis data collection and analysis of data occur simultaneously (Hsieh & Shannon, 2005; Sandelowski, 2000). Descriptive content analysis is especially useful to obtain answers to questions of relevance to practitioners regarding reasons to use or not use a particular protocol, such as the national asthma guidelines (Sandelowski, 2000). Qualitative content analysis identified perceptions of nurse practitioners’ about the use of national guidelines for asthma in providing care to adolescents with asthma (Profetto- McGrath et al., 2007; Simpson et al., 2007).

The researcher read the transcripts several times to become familiar with the content. Having read all the transcripts, the researcher identified persistent words or phrases within the transcribed data and developed labels for these key words and phrases that captured the meaning of the idea expressed. These labels were the codes used in managing the data. The researcher then categorized related pieces of text according to recurring key concepts and quotations from the transcripts (Profetto-McGrath et al., 2007; Ring et al., 2005; Krippendorff, 2004). “Best fit” of the data determined identification of codes and resulting categories (Sandelowski, 2000, p. 338). Codes were systematically applied over the course of the analysis (Sandelowski, 2000). Using a systematic and scientifically based coding scheme allowed the researcher to establish trustworthiness in the inquiry (Hsieh & Shannon, 2005).

The result of content analysis was development of categories, subcategories, and a descriptive summary of the perceptions of nurse practitioners at the LCCHWC (Sandelowski,

2000). Comparison of key words and concepts across individual interviews identified similarities and differences in common perceptions. Content analysis produced a descriptive summary of the patterns of practice of nurse practitioners at the LCCHWC in caring for adolescents with asthma (Sandelowski, 2000).

### Data Collection Instrumentation

#### *Inquiry Question 1 – Instrumentation - NPUQI*

The data collection instrument to answer inquiry question 1, *Nurse Practitioner Use of Quality Indicators in Providing Care to Adolescents with Asthma* (NPUQI) comprises 22 quality indicators organized to reflect recommendations from the national asthma guidelines and from quality measures found in the asthma continuous quality improvement plan in place at LCCHWC (NHLBI, 2007; LCCHWC, n.d.) (see Appendix E). The NPUQI was used for collection of data on patient demographics from the adolescent health record and nurse practitioner care practices from each patient encounter.

#### *Validity of the NPUQI Instrument*

Rossi (2004) states that standards of care adopted by health care providers “provide a set of criteria against which to assess program performance in health care settings” (Rossi, 2004, p. 174). The researcher developed the NPUQI using quality indicators in the NHLBI 2007 asthma guidelines. The code book with a clear set of protocols guided data collection and promoted consistency in data collection (Gearing et al., 2006; Insel, n.d.; Burns & Grove, 2005) (see Appendix G). Two nurse practitioners with expertise in the care of patients with asthma reviewed the content of the NPUQI instrument to determine appropriateness of the chosen quality indicators to evaluate NHLBI 2007 asthma guidelines using an Expert Content Reviewer form (see Appendix I). Both reviewers reported 100% agreement that all content areas of the

NHLBI 2007 asthma guidelines were in the NPUQI instrument. One reviewer recommended adding “each visit” to the code book definitions for the asthma questionnaire and the asthma classification indicators, and to add an additional medication to the list of short acting medications in the code book. The other reviewer recommended adding “missing data” to the code book list of medications. The researcher made all recommended additions to the NPUQI code book.

### *Inquiry Question 2 – Instrumentation – UNAG*

The data collection instrument to answer inquiry question 2 was the *Perceptions of Nurse Practitioners on Use of National Asthma Guidelines in Providing Care to Adolescents with Asthma: Survey and Semi-Structured Interview Guide* (UNAG) (see Appendix F). The provider demographic section of the UNAG addressed demographic characteristics of the nurse practitioners at the LCCHWC. The code book provided a clear set of definitions for the demographic data (see Appendix H). The survey and semi- structured interview guide had general and targeted questions based on standards of care for nurse practitioners as defined by the AANP. The UNAG Survey and Semi-Structured Interview Guide consists of eight general survey questions and five targeted interview questions. Questions matched the operationalized variables in the NPUQI instrument, in order to strengthen validity and reliability of the semi-structured interview guide.

### *Trustworthiness of the UNAG*

Graneheim and Lundman (2004) describe three concepts used to establish trustworthiness in qualitative content analysis: credibility, dependability, and transferability. Credibility is confidence that the data and the processes of analysis address the focus of the study. Choosing appropriate participants to answer the inquiry question is essential to the credibility of the study.

All nurse practitioners who had provided care to adolescents with asthma in the specified time frame at the LCCHWC were invited to participate, strengthening the credibility of the data. Selection of suitable “meaning units” (Graneheim et al., 2004, p. 110) is also essential to establish credibility in research. Use of a combined survey and semi- structured interview guide focused participant’s responses. Categories were described using representative quotations from the transcribed text.

Dependability is the level of stability throughout the analysis process. In this study, triangulation of methods and an inquiry audit supported dependability. Triangulation of methods was through health record review and interviews with nurse practitioners, which provided two sources of data through which the researcher could analyze findings. The inquiry audit by the committee chair provided feedback to assure explication of inquiry decisions and prevention of “early closure” which could potentially reflect researcher bias (Lincoln & Guba, 1985, p. 324). To establish intercoder reliability, two coders, in addition to the researcher, coded 20% of the meaning units recorded in the transcripts. Agreement among the author and the two other coders in coding the 39 meaning units of data ranged from .88 to .95 ( $M = .92$ ) which is a good and acceptable level of agreement (Burns & Grove, 2007). Use of the semi- structured interview guide limited inconsistency by the interviewer in the interview process (Graneheim & Lundman, 2004).

Transferability is the extent to which findings can be transferred to other settings or groups. A clear description of the characteristics of the participants, data collection, and process of data analysis augments transferability (Graneheim & Lundman, 2004) by allowing other researchers to read the description of the research and determine applicability of the research to their own settings.

### Timeline

Following approval by the institutional review boards from both TTUHSC and The University of Arizona, the researcher initiated data collection procedures. Data collection from the retrospective health record review occurred over a three week time period. Interviews occurred concurrently and immediately following the health record review, based on preferences of the participants. The interviews lasted approximately 30 minutes each ( $N = 8$ ). The researcher completed data collection in six weeks. Transcription of the interviews lasted two weeks due to the transcriptionist's schedule. Analysis of data took six weeks. Data collection and analysis took a total of three months to complete.

### Budget

The budget for this practice inquiry was:

Transcriptionist	\$175
Office Supplies- paper/ink	\$200
Tape recorder and audiotapes	\$ 75
SPSS (Student Version)	\$199
Gift cards	\$80
Total	\$729

Other resources included office space and computer use provided at no cost by the LCCHWC. Biostatistician services and assistance with data entry were provided at no cost to the researcher by TTUHSCATPSON.

### Limitations of this Study

Because the sampling process was not random, the possibility of systematic bias existed (Burns & Grove, 2007). The nurse practitioners were all faculty at the TTUHSCATPSON and

may differ in practice patterns compared to nurse practitioners in the general population because of exposure to evidence based practice through the school of nursing curriculum. Limitations of this sample of convenience may decrease generalizability to other clinical settings. In addition, because many of the nurse practitioners only practice one day a week at the LCCHWC, their overall experience level may be less than a nurse practitioner that practices 40 hours per week in a clinic setting. A limitation of qualitative data collection can be a conscious or unconscious motivation by the researcher to guide the interview. An interview guide ensured that the interviewer asked participants the same questions, minimizing this threat (see Appendix F).

A potential bias of the retrospective health record review was possible bias of the investigator when collecting the data. The investigator protected against this bias by having conceptual and operational definition of variables, data collection instruments based on established quality indicators, and controlled data collection procedures (Burns & Grove, 2007). There were criteria to abstract data reliably and in an unbiased manner from the patient health records (Worster, 2004) (see Appendix E). It is possible that some cases were not coded correctly as asthma in the patient health record, which may have led to the researcher missing eligible cases in the study. Other necessary data may have been missing from the record. The researcher recorded all missing data as not documented for this study.

### Summary

This chapter summarizes the design, data collection, and analysis methods for the practice inquiry. The study used mixed methods, with both quantitative and qualitative data, to determine patterns of practice and perceptions of practice by nurse practitioners in caring for adolescents with asthma, and to evaluate the current patterns of practice in comparison with national standards for providing care to adolescents with asthma at the LCCHWC. The setting



was a nurse-managed academic primary care clinic in West Texas. The sample was a non-random convenience sample of nurse practitioners who provide care in the chosen clinic setting. The study methods addressed the two inquiry questions. The researcher obtained IRB approval. Inquiry question one was addressed using a retrospective health record review of nurse practitioner practices in providing care to adolescents with asthma in a specified time frame. Inquiry question two was addressed using an interview guide with data analyzed by qualitative content analysis to determine nurse practitioner perceptions about providing care to adolescents with asthma. The researcher discussed development of the data collection instruments, validity of the NPUQI instrument, trustworthiness of the UNAG instrument, and limitations of the study plan. Chapter III outlines the plan for completion of the practice inquiry, including the timeline and budget, and served as the blueprint to guide the study.

## CHAPTER IV: RESULTS

The purpose of this chapter is to present the results of the practice inquiry. The researcher used quantitative methods to determine the answer to the first inquiry question and both quantitative analysis and qualitative content analysis in answering the second inquiry question. For inquiry question 1, analysis of the data from the NPUQI instrument is presented as frequencies and percentages of documented use of the chosen quality indicators. Results are organized in alignment with the NPUQU instrument and reflect the AANP standards of care of assessment, diagnosis, evaluation of the patient health status, and development and implementation of a treatment plan (AANP, 2007). For inquiry question 2, the UNAG survey data are presented as frequencies and percentages of nurse practitioner responses to the eight general survey questions. Content analysis of the five targeted UNAG interview questions are presented as six categories and twenty-two subcategories, with examples of nurse practitioner responses provided.

### Inquiry Question 1 - Results

#### *NPUQI Assessment and Diagnosis Results*

Analysis of health records of adolescents with asthma revealed that data from nurse practitioner documentation achieved 70% agreement with three of the six quality indicators chosen to evaluate assessment of health status. Documentation of vital signs was in 100% of the health records reviewed ( $N = 54$ ), while documentation of a past medical history and physical examination were 96% ( $n = 52$ ) and 91% ( $n = 49$ ) respectively. Documentation of quality of life ( $n = 16$ ), use of rescue inhaler ( $n = 11$ ), and history of smoking ( $n = 31$ ) were below the 70% comparison needed to reflect adoption of the NHLBI 2007 asthma guidelines by nurse practitioners.

There was minimal documentation of the quality indicators used to chosen to determine diagnosis of asthma by the nurse practitioners. Analysis of health records of adolescents with asthma revealed that data from nurse practitioner documentation achieved 70% agreement with only one of the six quality indicators chosen to evaluate diagnosis. Documentation of pulmonary function by nurse practitioners occurred in greater than 76% ( $n = 41$ ) of the health records. Documentation of number of days and nights with symptoms ( $n = 23$ ;  $n = 21$ ), triggers ( $n = 20$ ), asthma questionnaire ( $n = 17$ ) and asthma classification ( $n = 20$ ) were below the 70% comparison needed to reflect adoption of the NHLBI 2007 asthma guidelines by the nurse practitioners (see Table 3).

TABLE 3: *Results of the NPUQI Quality Indicators for Assessment and Diagnosis*

Evidence of Documentation of:	% ( $n$ )	( $N = 54$ )
Vital Signs	100	( $n = 54$ )
Past Medical History	96	( $n = 52$ )
Physical Examination	90	( $n = 49$ )
Pulmonary Function	76	( $n = 41$ )
History of Smoking	57	( $n = 31$ )
Days with Symptoms	43	( $n = 23$ )
Nights with Symptoms	39	( $n = 21$ )
Triggers	37	( $n = 20$ )
Asthma Classification	37	( $n = 20$ )
Asthma Questionnaire	31	( $n = 17$ )
Quality of Life	30	( $n = 16$ )
Use of Rescue Inhaler	20	( $n = 11$ )

#### *NPUQI Development, Implementation and Evaluation Results*

Analysis of health records of adolescents with asthma revealed that data from nurse practitioner documentation achieved 70% agreement with three of the five quality indicators of the NHLBI 2007 asthma guidelines chosen to evaluate development and implementation of a plan of care. Evidence of documentation of scheduled follow up visits was in 93% ( $n = 50$ ) of the records reviewed, although recommendations varied. Nurse practitioners recommended follow

up at three months 54% of the time ( $n = 29$ ), while follow up at six months and one year were 6% ( $n = 3$ ) and 2% ( $n = 1$ ) respectively. Recommended follow up at other intervals occurred in 32% ( $n = 17$ ) of the health records reviewed. Evidence of documentation of rescue medications was in 74% ( $n = 40$ ) of the records reviewed and documentation of asthma education in 70% ( $n = 38$ ) of the health records reviewed. Documentation of controller medications occurred in 54% ( $n = 29$ ) of the health records reviewed, and documentation of an asthma action plan in only 11% ( $n = 6$ ) of the health records reviewed, both well below the 70% needed to reflect adoption of the NHLBI 2007 asthma guidelines by the nurse practitioners.

There was minimal documentation of the quality indicators used to chosen to determine evaluation of current plans of care by the nurse practitioners. Analysis of health records of adolescents with asthma revealed that data from nurse practitioner documentation achieved 70% agreement with only one of the five quality indicators chosen to evaluate evaluation of the NHLBI 2007 asthma guidelines. Evidence of documentation of pulseoximetry occurred, or was not required to be documented based on the guidelines, in 74% ( $n = 40$ ) of health records reviewed. Evidence of documentation of emergent care visits, exacerbations since previous visit, missed days of school or work were present or not required to be present based on the asthma guidelines in 19% ( $n = 10$ ), 26% ( $n = 14$ ), and 11% ( $n = 6$ ) of the health records respectively. There was documentation of pharmacotherapy adherence in only 44% ( $n = 24$ ) of the health records reviewed (see Table 4).

TABLE 4: *Results of the NPUQI Quality Indicators for Development, Implementation and Evaluation*

Evidence of Documentation of:	% (n) (N = 54)	
Scheduled Follow Up	93	(n = 50)
Pulseoximetry	74	(n = 40)
Rescue Medication Prescribed	74	(n = 40)
Asthma Education	70	(n = 38)
Controller Medication Prescribed	54	(n = 29)
Pharmacotherapy Adherence	44	(n = 24)
Exacerbations since Previous Visit	26	(n = 14)
Urgent Care Visits since Previous Visit	19	(n = 10)
Asthma Action Plan	11	(n = 6)
Missed Days of Work/School	11	(n = 6)

### Inquiry Question 2 - Results

#### *UNAG Survey Results*

Analysis of the data from the UNAG survey revealed that all respondents ( $N = 8$ ) reported that they had gained knowledge of the NHLBI 2007 asthma guidelines during the time frame from August 2007 to July 2008. The responses indicated that the nurse practitioners were aware of the guidelines from 12 – 24 months prior to data collection for this study. The respondents noted first hearing about the NHLBI 2007 asthma guidelines from a variety of sources, including a LCCHWC colleague ( $n = 1$ ), a non- LCCHWC colleague ( $n = 1$ ), journal article ( $n = 3$ ), professional conference ( $n = 1$ ) and other sources ( $n = 2$ ). One nurse practitioner wrote that the internet was the source used for learning about asthma guidelines. All respondents considered the use of standards of care in providing care to adolescents with asthma as extremely important ( $n = 5$ ) or quite important ( $n = 3$ ) and described their comfort level in using the guidelines as totally comfortable ( $n = 2$ ) or mostly comfortable ( $n = 6$ ). When describing the percentage of time they used the national standards of care when providing care to adolescents with asthma at clinic visits, the respondents reported use 75-100% of the time ( $n = 7$ ) and 50-74% of the time ( $n = 1$ ). Resources used when developing a plan of care for an adolescent with

asthma were the NHLBI 2007 asthma guidelines ( $n = 7$ ), peer reviewed journals ( $n = 4$ ), medical or nursing textbooks ( $n = 2$ ), and the internet ( $n = 1$ ). Nurse practitioners indicated follow up for an adolescent with moderate controlled asthma to be once a month ( $n = 2$ ), every three months ( $n = 5$ ) and every six months ( $n = 1$ ).

### *UNAG Interview Results*

Analysis of data from the UNAG interviews produced six categories in providing care to adolescents with asthma that nurse practitioners considered important. The categories are assessment, plan of care, evaluation of plan, use of evidence based practice, ability to comply, and determinants of health (see Table 5).

TABLE 5: *UNAG Interview Results: Categories and Subcategories*

Category/Subcategory	Participants citing responses ( $N = 8$ )
Assessment	
Physical Exam	8
Patient History	8
Symptoms	8
Triggers	2
Medication History	6
Diagnostics	8
Plan of Care	
Education	6
Action Plan	2
Advocacy	3
Patient-Provider Collaboration	2
Referrals	1
Evaluation of Plan	
Reassessment	2
Medication Evaluation	2
Follow Up	3
Use of Evidence Based Practice	
Asthma Classification	3
Use of Guidelines	4
Step-wise Care	2
Ability to Comply	
Provider Concerns	6
Barriers to Care	5
Determinants of Health	
Play/Exercise	3
Impact on Life	5
Asthma Control	2

### *Assessment*

Assessment, defined as actions by nurse practitioners to determine the health status of adolescents with asthma, includes gathering subjective and objective data. The category, assessment, had six subcategories: physical exam, patient history, symptoms, triggers, medication history and diagnostics. All nurse practitioners indicated that physical assessment, patient history, and patient symptoms were of great importance in providing care to an adolescent with asthma ( $N = 8$ ), while only 75% ( $n = 6$ ) of the nurse practitioners indicated the importance of obtaining a medication history. The presence of symptoms such as a daytime cough, nighttime cough, shortness of breath, orthopnea, and the frequency, severity and duration of the symptoms were recurring meaning units found within the interview transcripts. All nurse practitioners reported the need for diagnostics such as peak flow, pulseoximetry, and spirometry in assessing or diagnosing asthma in adolescents.

### *Plan of Care*

The definition for plan of care is recommendations from the nurse practitioners for treating or controlling asthma in an adolescent. The five subcategories of plan of care were: education, action plan, advocacy, patient-provider collaboration and referrals. Most nurse practitioners considered education as the most important factor in developing the plan of care for adolescents with asthma ( $n = 6$ ), including education for the adolescent and family about asthma, triggers, and medications to treat asthma. One comment made, "I think that the biggest thing we have is just education", exemplifies this concept. While the nurse practitioners expressed the importance of asthma education in caring for an adolescent with asthma, only two nurse practitioners mentioned the importance of an asthma action plan as used by an adolescent to self-manage asthma during daily activities. One nurse practitioner added the need for educating

school personnel in a plan of care for adolescents, stating not just the importance of “patient and family understanding of the treatment plan” but also “the treatment plan that they can utilize at school, making sure the school personnel understand their treatment plan.” Another nurse practitioner noted “Education, trying to get them the information they might not have access to an internet at home, especially if they are an adolescent... they would like to look it up because there are a lot of great websites... to help learn about so they can take care of themselves” in explaining the importance of age appropriate interventions.

Nurse practitioners expressed the importance of their role as an advocate for the patient, and the importance of collaboration between the provider and patient when developing a plan of care. One nurse practitioner stated that “first and foremost becomes that relationship that you have ... insuring that you have established trust and rapport, and a good line of communication” when discussing the importance collaboration between the provider and patient when developing a plan of care.

#### *Evaluation of Plan*

The next category, evaluation of plan by the nurse practitioners, was defined as methods used to determine the effectiveness of an established plan of care. The three subcategories of evaluation were: reassessment of the patient, determining the effectiveness of the prescribed medications, and regularly scheduled follow up visits. Less than half of the nurse practitioners indicated the importance of reassessment ( $n = 2$ ), medication evaluation ( $n = 2$ ), or scheduled follow up visits ( $n = 3$ ) in providing care to an adolescent with asthma. One nurse practitioner stated “I also want them to understand the medication that their taking and why their taking it and what the side effects of the medication are... I want to make the medicine as cost effective as



possible keep it from interfering in their daily activities like sports” in describing education about the asthma medications and the importance of follow up.

#### *Use of Evidence-based Practice*

The use of evidence based practice by the nurse practitioners, defined as verbalization of the use of relevant protocols in assessment, diagnosis, treatment, and evaluation of adolescents with asthma is the next category. Subcategories were the classification of asthma, use of asthma guidelines, and step-wise care. Protocols mentioned were the national asthma guidelines and also protocols found within a current nursing textbook. While few of the nurse practitioners ( $n = 3$ ), mentioned the need to classify asthma in stages of severity, the importance of using asthma guidelines and step- wise care in assessment, diagnosis, and evaluation of an adolescent were discussed by 75% ( $n = 6$ ) of the nurse practitioners. For example, one nurse practitioner stated, “make a complete diagnosis on the type of asthma that the patient has and then implement the treatment plan according to those clinical... practice guidelines” in discussing the need to classify asthma and follow guidelines. Other comments about the importance of using a step-wise approach in caring for adolescents with asthma were, “just go through the steps and see where they are,” and, “I think utilizing that step wise approach... found in the clinical practice guidelines,” when discussing criteria used to diagnose an adolescent with asthma.

#### *Ability to Comply*

Ability to comply, defined as the ability of the adolescent and family to follow through on the recommended treatment plan, is the next category. Two subcategories emerged from the content analysis: provider concerns and barriers to care. A majority of nurse practitioners ( $n = 6$ ) cited concerns that the family would comply with the plan of care. One nurse practitioner stated “I don’t really like that word compliant but I would say able the patient ability to follow through

on the recommended treatment plan” in expressing this concern. Nurse practitioners ( $n = 5$ ) cited barriers to care such as financial constraints, ability to obtain medications, lack of transportation, and language barriers as impacting development of a plan of care. One provider commented “what the clinical practice guidelines recommend, then insuring that they are going to be able to either from a financial standpoint, transportation standpoint, language standpoint, and all those things we look at as nurse practitioners that they have the ability to follow through on what you’re recommending.” Another nurse practitioner described concerns about compliance and use of medication saying, “because a lot of times the kids that I do see... come back in and their parents or whoever is with them says they’ve been out of their medication for who knows how long and now their having trouble again.”

### *Determinants of Health*

The last category considered relevant by the nurse practitioners was determinants of health, defined as factors that impact the ability of adolescents to function in every day activities. Subcategories were play and exercise, the impact of asthma on daily activities, and degree of asthma control. The effect of asthma on the ability of the adolescent to participate in play or exercise activities ( $n = 3$ ) the overall impact of asthma on the life of an adolescent with asthma ( $n = 5$ ) and the degree of asthma control ( $n = 2$ ) were often mentioned in context with the quality of life for an adolescent with asthma. One nurse practitioner described this as, “we’re talking about children, take them out of play whenever they are on the playground or whether they can actually go and do what they want to... impacts their life quality of life.” In discussing asthma control and the impact of asthma on life, one nurse practitioner stated, “see if we can get it stabilized where it really doesn’t interfere with their daily activities in school and what they would like to do” as a factor important in providing care to adolescents with asthma.

## Summary

This chapter presents results of analysis of data obtained during the practice inquiry from the NPUQI review of health records, the UNAG survey, and the UNAG interview transcripts. Data analysis of results from the NPUQI health record review indicated adoption of 8 of 22 quality indicators of the NHLBI 2007 asthma guidelines. These quality indicators were: vital signs, physical examination, past medical history, pulmonary function, asthma education, prescription of rescue medications, scheduled follow up visits, and pulseoximetry. The UNAG survey indicated all nurse practitioners from the LCCHWC had previous knowledge of the asthma guidelines and used it more than half of the time when providing care to adolescents with asthma. All respondents considered the use of standards of care in providing care to adolescents with asthma important and described themselves as comfortable in using the asthma guidelines. Results indicated that nurse practitioners used the national standards of care more than half the time when providing care to adolescents with asthma. Content analysis of the UNAG interviews identified six categories with 22 subcategories that the nurse practitioners considered important in caring for adolescents with asthma. The categories were assessment, plan of care, evaluation of plan, use of evidence based practice, ability to comply, and determinants of health. In addition, nurse practitioner comments provided support of the defined categories.

## CHAPTER V: DISCUSSION

The purpose of this inquiry was to explore patterns of practice and perceptions of practice by nurse practitioners who care for adolescents with asthma, and to evaluate the current patterns of practice in comparison with national standards for providing care to adolescents with asthma at LCCHWC. The discussion chapter addresses the results of this practice inquiry in relation to the diffusion of innovation theory, revealing patterns in adoption of asthma knowledge. Discussion focuses on results in relation to the two inquiry questions and relevance of the results for nurse practitioner practice and use of process of care recommended by the AANP (2007). Lastly, discussion of the strengths and limitations of the study, as well as the implications of the study for nursing practice occur.

### Adoption of Asthma Knowledge by Nurse Practitioners

While the LCCHWC nurse practitioners addressed all components of the process of care recommended by the AANP (2007), which includes assessment, diagnosis, development and implementation of a treatment plan, and evaluation of the patient status, only 8 of the 22 quality indicators of the NPUQI were documented above the 70% level needed to reflect adoption of the NHLBI 2007 asthma guideline by nurse practitioners. The LCCHWC nurse practitioners' perceptions regarding their own adoption of the NHLBI 2007 asthma guidelines were positive overall regarding using the guidelines in the care of adolescents with asthma.

The components of assessment and diagnosis were evaluated using 12 quality indicators found on the NPUQI. Documentation indicated adoption of four of these quality indicators: vital signs, physical examination of the patient, review of past medical history, and pulmonary function tests. The components of development and implementation of a treatment plan and evaluation of patient status were evaluated using 10 quality indicators found on the NPUQI.

Documentation indicated adoption of four of these quality indicators: asthma education, use of pulseoximetry, prescribing appropriate rescue medications, and scheduling follow up appointments.

While these results indicate at least partial adoption of the NHLBI 2007 asthma guidelines, the results from the NPUQI do not correspond with the UNAG results in which seven of the eight nurse practitioner respondents indicated they use the guidelines at least 75% of the time. It is possible that social desirability bias on the part of the participants played a role in the discrepancy between these results, as the nurse practitioners are peers of the researcher, and may have even unintentionally self-reported use of the guidelines in a manner that would meet with approval from a peer (Kazdin, 2003).

#### *Stages of Dissemination*

Relevant for this study is examination of the extent to which results correspond with the stages of dissemination and the five attributes of the diffusion of innovation theory (Rimer & Glanz, 2005; Rogers, 2003). The five stages of dissemination, knowledge, persuasion, decision, implementation and confirmation reflect both characteristics of individuals and perceived characteristics of the innovation itself (Rogers, 2003).

#### *Knowledge*

All nurse practitioners indicated previous knowledge of the NHLBI 2007 asthma guidelines on the UNAG survey. Using the Adoption of Asthma Knowledge Model (Figure 1) reveals that the nurse practitioners had achieved the first stage of dissemination, knowledge.

#### *Persuasion*

During the persuasion stage, nurse practitioners form either a positive or negative attitude towards the innovation, the NHLBI 2007 asthma guidelines. Comments from nurse practitioners

revealed favorable opinions about use of the asthma guidelines from more than half of the nurse practitioners interviewed, indicating overall positive attitude towards the guidelines. In the persuasion stage, the nurse practitioners would seek information about the innovation and share it with among peers (Geibert, 2006). Nurse practitioners indicated learning about the NHLBI 2007 asthma guidelines from a variety of sources, including colleagues at the LCCHWC. While the nurse practitioners may have varying levels of experience with the NHLBI 2007 asthma guidelines, the UNAG results indicated that all nurse practitioners considered the guidelines to be important, demonstrating achievement of the persuasion stage of the diffusion of innovation theory.

### *Decision*

In the decision stage of dissemination, the nurse practitioner makes the decision to adopt or not adopt the asthma guidelines. While all nurse practitioners considered the use of the NHLBI guidelines to be important, other factors influenced the decision to implement a plan of care. Rationales to use or not use the guidelines were impacted by potential barriers to care, especially financial constraints of the patient and family, and perceptions of the nurse practitioners of the ability of the patient to comply with the plan of care. All but one of the nurse practitioners indicated that they used the NHLBI 2007 asthma guidelines in providing care to adolescents with asthma at least 75% of the time, indicating they had made the decision to adopt the guidelines.

### *Implementation*

In this stage, the nurse practitioner incorporates use of the NHLBI guidelines into a daily routine. Implementation closely follows the decision stage (Geibert, 2006). While implementation may be affected by personal characteristics of the providers, UNAG results

indicated the nurse practitioners were similar in race, language, and age range (Francke et al., 2008; O'Laughlen, Hollen, Rakes, & Ting, 2008). Provider knowledge and attitude may also affect implementation of the asthma guidelines (O' Laughlen et al., 2008).

Ting (2002) described three reasons that health care providers may not implement the NHLBI asthma guidelines due to personal characteristics of the provider. These reasons are: having difficulty remembering how to classify asthma severity, remembering step-wise therapy based on asthma severity, and remembering brands and doses for inhaled corticosteroids. Despite the majority of the nurse practitioners making the decision to adopt the NHLBI 2007 asthma guidelines, only 8 of the 22 quality indicators on the NPUQI instrument achieved the 70% documentation rate necessary to indicate adoption in this practice inquiry. This indicates that nurse practitioners had not fully achieved the implementation stage of the diffusion of innovation theory.

#### *Confirmation*

Confirmation can be determined when use of the NHLBI guidelines is integrated consistently into the practice behaviors by the nurse practitioners at the LCCHWC. This final stage of dissemination is not evidenced in the patterns of practice of the nurse practitioners at the LCCHWC. Adoption of only 8 of the 22 quality indicators on the NPUQI, despite nurse practitioner comments during the UNAG interviews about the importance of using evidence based practice in the form of guidelines, indicates that nurse practitioners had not fully integrated the NHLBI 2007 asthma guidelines into providing care to adolescents with asthma.

#### *Attributes*

Factors that impede or promote adoption of the NHLBI 2007 asthma guidelines may be explained by the five attributes of innovations: relative advantage, compatibility, complexity,

trialability, and observability. While interview questions were not targeted to specifically address the attributes of diffusion of innovation, factors that may impede or promote use of the guidelines emerged during the interview process. These attributes of the innovation of the NHLBI guidelines are relevant in discussing how nurse practitioners adopted the NHLBI 2007 asthma guidelines.

#### *Relative Advantage*

Because the NHLBI 2007 asthma guidelines are based on the best evidence available, it is conceivable that their credibility would be a relative advantage. While no direct mention of the strength of the evidence was mentioned during the UNAG interviews, all nurse practitioners expressed the importance of evidence based practice based on national asthma guidelines in caring for adolescents with asthma, indicating acceptance of this relative advantage.

#### *Compatibility*

Compatibility exists when new information is consistent with experience and needs of the adopters (Rimer & Glanz, 2005; Rogers, 2003). While the researcher anticipated some degree of compatibility with the guidelines because the NHLBI 2007 asthma guidelines are consistent with the highest levels of evidence, congruent with TTUHSCATPSON, where the nurse practitioners all serve as faculty (TTUHSCATPSON, n.d.a.), this could not be determined from the results of this study. Results from the UNAG did not establish whether these guidelines were consistent with nurse practitioner experience and needs so determination of compatibility was not possible.

#### *Complexity*

Complexity or degree of ease of use of the NHLBI 2007 asthma guidelines was not evaluated as part of this practice inquiry. It is not possible to determine if the attribute of complexity impeded or promoted adoption of the NHLBI 2007 asthma guidelines from the



results from this study. Although the NHLBI guidelines appear clear and concise on presentation, the nuances embedded in the steps may increase the complexity level for use at a primary care clinic. While nurse practitioners did not address the issue of complexity during this study, less than half of the health records reviewed had evidence of asthma classification documented, and few of the nurse practitioners mentioned classification of asthma in stages of severity, which is a necessary component in using step-wise care according to the national guidelines. It is possible that this lack of documentation of the asthma guidelines resulted from the complexity of the criteria necessary to differentiate specific asthma classifications or to the length of the guidelines themselves, which are more than 400 pages in the full version.

Lack of adherence to documentation of asthma severity has been implicated as primary reason health care providers do not adhere to the asthma guidelines (Ting, 2002). Ting stated that complexity of the NHLBI 2007 asthma guidelines impacts health care provider adherence to the guidelines. Ting developed a simpler method to remind health care providers to use the asthma guidelines. The tool, the Multicolored Simplified Asthma Guideline Reminder (MSAGR<sup>®</sup>), has been used worldwide to strengthen health care provider adherence to the national asthma guidelines (Ting, 2002).

O'Laughlen et al. (2008) specifically mention lack of adherence to documentation of asthma classifications as being attributed to complexity of the guidelines, and Francke et al. (2008) affirms that guidelines that are less complex have a greater chance of implementation. O'Laughlen et al. (2008) conducted a study in a rural county of Virginia, to determine the feasibility of use of the MSAGR<sup>®</sup> in a pediatric setting and determine whether differences in asthma outcomes in pediatric patients occurred because of use of this tool. Results from this

study were positive in that the MSAGR© was determined to be helpful to health care providers in classifying asthma severity. The attribute of complexity should be addressed in a future study.

### *Trialability*

Trialability, which would allow the nurse practitioners to try out the new asthma guidelines prior to adoption, was not evaluated as part of the UNAG interviews. It is not possible to determine if the attribute of trialability impeded or promoted adoption of the asthma guidelines in this study. Trialing specific portions of the guidelines might improve overall documentation by allowing the nurse practitioner to focus on just a few of the quality indicators at a time (Geibert, 2006). A protocol specific to this clinic population might also be beneficial, providing information to decrease barriers to care and alleviate nurse practitioner concerns about patient ability to comply with a plan of care.

### *Observability*

Observability, or the degree in which the NHLBI 2007 asthma guidelines was communicated among the nurse practitioners, was a factor that promoted adoption of the NHLBI 2007 asthma guidelines. Nurse practitioners reported that they learned about the guidelines from varying sources, including LCCHWC colleagues. While nurse practitioners acknowledged learning about the guidelines, there was no further discourse from the nurse practitioners during the interviews about sharing information about the guidelines in the clinic setting. An increase in professional dialogue among the nurse practitioners might improve adoption of the guidelines by reminding them to document the quality indicators of the asthma guidelines.

### Perceptions About Asthma National Guidelines by Nurse Practitioners

Nurse practitioner perceptions about their own adoption of the asthma guidelines are discussed in context of the AANP standards of care: assessment, diagnosis, development and

implementation of a treatment plan, and evaluation of the patient status (AANP, 2007) are discussed in this section.

### *Perceptions About Assessment and Diagnosis*

Nurse practitioners emphasized the importance of assessment, a key component in the NHLBI 2007 asthma guidelines, throughout the process of care as defined by the AANP (2007). They expressed the need to gather both subjective and objective information as necessary for initial assessment of the patient, diagnosis, and evaluation of the treatment plan, indicating that assessment is ongoing through the process of care. Documentation of the physical examination and other objective measures such as pulmonary function exceeded the 70% comparison needed to reflect adoption of the NHLBI guidelines and 100% of nurse practitioners mentioned the importance of physical examinations during the interview process. While nurse practitioner perception of the importance of the physical examination is significant in the provision of care to adolescents with asthma, nurse practitioners identified other factors that require assessment.

The need for assessment about the patient's ability to comply with a recommended plan of care was a concern expressed by 75% of the nurse practitioners, with barriers to care such as financial constraints, transportation, language barriers, lack of resources and inconsistent use of health care providers emerging as specific concerns of nurse practitioners during the UNAG interviews.

Authors of other research similarly report barriers of language, transportation, financial concerns, and inconsistent use of health care providers. Reports specifically mention language barriers (Chan et al., 2005; Halterman et al., 2000; Ineklas et al., 2008; NHLBI, 2007) and inconsistent use of health care providers (Brotanek et al., 2005) to negatively impact asthma management plans through inadequate asthma therapy. Seid (2008) found that better access to

care led to better primary care experiences, supporting the need for transportation to health care facilities, and also identified consistent use of health care providers. McQuaid et al. (2005) found evidence that barriers to effective asthma management may relate more to socioeconomic status than other factors. While the nurse practitioners did not discuss barriers in detail, the fact that they mentioned barriers specifically, indicates awareness that finances, transportation, language, and available resources may impact management of asthma in an adolescent.

#### *Perceptions About Development, Implementation and Evaluation*

Nurse practitioners emphasized the importance of developmentally appropriate asthma education and the use of medications in developing, implementing, and evaluating a plan of care (AANP, 2007). The importance of asthma education emerged as a key concept by nurse practitioners throughout the interviews when developing a plan of care, consistent with the NHLBI stance that education should begin at diagnosis and be reinforced at every encounter (NHLBI, 2007). Lack of education regarding asthma and asthma self-management has been associated with poor outcomes in adolescents with asthma (NHLBI, 2007). Nurse practitioners verbalized the importance of educating the adolescent, family, and school personnel about the disease process, triggers, and use of medications, which is consistent with the asthma guidelines.

Implementing a written asthma action plan, which teaches the adolescent about self-management behaviors, is key in the education process (NHLBI, 2007). Only two nurse practitioners discussed the importance of an asthma action plan in the UNAG interviews, and evidence of documentation in the health records reflected a similar low rate of adherence. One nurse practitioner described the importance of adolescents learning to take care of themselves, and deemed the acquisition of knowledge important to this age group. Knight (2005) identified knowledge acquisition and self-efficacy as integral to improving outcomes for adolescents with

asthma. Nurse practitioners perceived developmentally appropriate education to include access to the internet, to improve self-management behaviors. Rhee, Ciurznski, and Yoos (2008) and Knight found that adolescents preferred more modern methods of teaching such as using the internet, which is consistent with the NHLBI 2007 recommendations that use of computer based programs is culturally appropriate in asthma education for adolescents. Recommendations for age appropriate education (Kyngas, 2003; Rance & Trent, 2005; Shegog et al., 2008) and better asthma education (Inkelas et al., 2008) were noted during the review of literature in chapter II and were found to improve adolescent health outcomes. No subcategories providing detail about how nurse practitioners would implement asthma education emerged, which should be explored in future studies.

Nurse practitioners verbalized the importance of medication use throughout the process of care (AANP, 2007), including the need to obtain a thorough medication history during assessment, select the most appropriate medication for the plan of care that the patient can afford, education about medication, and evaluating the effectiveness of the medication at follow up. Nurse practitioners considered the cost effectiveness of the medication and ability of the family to comply with the treatment regimen to be important when prescribing medications for the adolescents with asthma.

Nurse practitioner prescribing of controller medications such as inhaled corticosteroids was below the 70% comparison necessary to reflect adoption of the NHLBI guidelines, even though they are preferred long term control therapy for adolescents with persistent asthma. Minorities, who constituted 81% of the NPUQI health record sample and would be considered at higher risk for underuse of controlled medications (Farber et al., 2003; Halterman et al., 2000;

Lozano, Finkelstein, Hecht, Shulruff, & Weiss, 2003; Lieu et al., 2002; Ortega et al., 2002), though no mention of minorities were made by nurse practitioners during the UNAG interviews.

### Strengths and Limitations of the Study

A strength of this study is the descriptive study design chosen to determine perceptions of the LCCHWC nurse practitioners regarding their own adoption of an innovation, the NHLBI 2007 asthma guidelines, for their nursing practice, in providing care to adolescents with asthma. By using both qualitative and quantitative methods, the information gained from this study was strengthened as the results complement and validate each other (Donaldson, Rutledge, & Ashley, 2004), in addition to identifying a discrepancy.

The design of the study minimized sampling bias. Sampling bias for inquiry question one was minimized by using all patient records that met the inclusion criteria, which reflects all adolescent patients with asthma that received care at the LCCHWC during the time frame studied. For inquiry question two, all nurse practitioners that provided care to adolescents with asthma during the study time frame were invited to participate, which minimized sampling bias. There was an 89% response rate achieved, which is considered acceptable. This design allowed the results to reflect data that are real and true for the environment chosen for the study (Burns & Grove, 2007). Clear conceptual and operational definitions of variables, sample selection that included all nurse practitioners meeting inclusion criteria, and consistent data collection procedures helped protect against investigator bias (Burns & Grove, 2007).

Knowledge gained from this approach can guide planning of interventions to assist nurse practitioners in evaluating national standards to direct practice, educating nurse practitioners on the NHLBI 2007 asthma guidelines, and more generally in disseminating information on new guidelines as they appear on the horizon. While this study adds to the body of knowledge about

nurse practitioner use of standards of care, a limitation is the extent to which the findings can be transferred to other settings. While both sampling groups were representative of the LCCHWC, results obtained are specific to an academic nurse-managed primary care clinic, serving a specific clientele in West Texas. The nurse practitioners in this clinic setting are faculty at TTUHSCATPSON and their viewpoints may not be consistent with those of nurse practitioners in the general community. Information gained from this study has specific implications for this clinic setting and for the nurse practitioners who are providing care to adolescents.

One limitation occurred because of an upgrade to the e-charting system at the LCCHWC during the course of the study. A change occurred that automatically pulled the past medical history into the body of the health note. It is not possible from the set up of this upgrade to determine if the nurse practitioner had actually reviewed the past medical history. While the presence of past medical history documentation was found in 96% of the charts audited, it is not possible to determine if this is truly a relevant finding because of the upgrade that occurred. In addition, the researcher did not ask questions to elicit information on documentation of guideline behaviors of the nurse practitioners, so further research will be necessary to evaluate nurse practitioner views on documenting the asthma guidelines using the e-chart system at the LCCHWC.

#### Implications for Nursing Practice

This study addressed nurse practitioner perception of use of national guidelines in caring for adolescents with asthma and the extent to which nurse practitioner patterns of practice reflect the use of such guidelines in the clinical setting. As faculty at TTUHSCATPSON who teach the use of evidence-based practice on a daily basis, it could be argued that these nurse practitioners would be early adopters of the NHLBI 2007 asthma guidelines. While perceptions of the nurse

practitioners about their use of the guidelines support this viewpoint, the results from the review of health records do not reflect adoption of all components of the guidelines in caring for adolescent patients with asthma. With the LCCHWC recently attaining FQHC status, administration anticipates an audit of the use of standards of care, especially that of asthma, in the future. The NPUQI is currently being considered as a possible mechanism to measure use of asthma quality indicators in the clinic setting. While the nurse practitioners all verbalized the importance of using the asthma guidelines, this is not supported by the current level of documentation.

#### *Asthma Education*

Nurse practitioners indicated that education was a key component in providing care to adolescents with asthma during the UNAG interviews and achieved adoption of the quality indicator asthma education. While nurse practitioners supported asthma education for adolescents with asthma, they made no mention of how this education should be implemented. The review of literature clearly supported the importance of education for adolescents with asthma. Educational interventions should address attitudes, beliefs, behaviors, and skills using cultural and ethnic appropriateness. Health care providers should consider reading level and language barriers (Bailey et al., 2008; NHLBI, 2007) and the use of “culturally sensitive patient education” when implementing an asthma management program to improve asthma outcomes (NHLBI, 2007, p. 135). Adolescents should actively participate in health care decisions to improve both adherence to treatment plan and increase self-efficacy (Bacharier et al., 2008; NHLBI, 2007; Vessey & Mebane, 2000). Nurse practitioners should implement age appropriate education in promoting proper usage of medication and in preventing asthma related hospitalizations and missed days of school (Rance & Trent, 2005). Development of an asthma



education program that involves both the adolescent and caregivers, with a referral system to provide ease of access for the nurse practitioners should be considered for a future study.

### *Barriers to Using the Guidelines*

Complexity of the asthma guidelines may be a barrier for nurse practitioner implementation in the LCCHWC. The use of templates on the e-charting system to serve as a reminder to document quality indicators (Grover et al., 2007) or opportunity to trial portions of the guidelines over time may improve adoption rates by the nurse practitioners (Geibert, 2006). Guidelines may also need to be tailored for this particular practice setting. Nurse practitioners need to consider concerns about specific clinical problems such as adherence to a treatment plan when adjusting guidelines for a specific practice setting (Hay et al., 2008). Nurse practitioners should give priority to enhancing the translation of evidence-base practice into the clinic setting and improve documentation using the current e-charting system (Melnyk et al., 2004). Guidelines will be more effective if they are easy to use. Heffner, Irwin and Wunderink (2000) recommend improving access to guidelines using web enhanced technologies such as downloadable formats accessible at the point of care.

### *Active Dissemination*

Active dissemination of guidelines, including the use of educational activities, is more effective than passive dissemination, and the nurse practitioners at LCCHWC should explore these strategies to improve use of the guidelines (Melnyk et al., 2004; Ring et al., 2005). Examples of educational activities that could be considered for use at the LCCHWC are the use of mentors (Melnyk et al., 2004), performance feedback (Ring et al., 2005), informal meetings (Profetto-McGrath et al., 2007), workshops (Melnyk et al. 2004; Profetto-McGrath et al., 2007) and the use of electronic documentation templates (Grover et al., 2007). Many of these strategies

would be cost effective, easily implemented, and target all nurse practitioners who provide care to adolescents with asthma at the LCCHWC.

While the literature contains examples of nursing and physician perceptions about using standards of care, there were limited examples that described perceptions of nurse practitioner regarding use of standards of care such as the NHLBI 2007 asthma guidelines. This study focused specifically on the use of the NHLBI 2007 asthma guidelines as the standard of care for adolescents with asthma, as used by nurse practitioners at the LCCHWC. By discussing the results within the context of the diffusion of innovation theory and the review of literature, understanding of nurse practitioner perceptions about the use of standards of care may be increased.

Ryton, Grant, Little, and Gilsenan (2007), state that it is the responsibility of all health care providers to be up to date on the newest developments in order to assure that patients receive the best possible care. Without adequate quality management, providers within a system may not manage asthma consistent with the national guidelines and this may contribute to disparities in care. By adhering to an evidence based, asthma clinical practice guideline, providers may reduce or even eliminate disparities found in asthma treatment. The national asthma guidelines provide consistent care across all racial, ethnic, and socioeconomic backgrounds (NHLBI, 2007). Evaluating treatment practices for children with asthma will require improved education for nurse practitioners about the guidelines for care. Incorporation of new standards of care will require appropriate dissemination to nurse practitioners and acceptance and implementation into practice settings (Halterman et al., 2000; Melnyk et al., 2004; Ring et al., 2005). Using the NHLBI 2007 guidelines to direct asthma care for adolescents may help reduce health disparities in this vulnerable population.

### Recommendations for Future Research

While the nurse practitioners considered asthma education important in providing care to adolescents with asthma in the interviews, there was no mention of how this asthma education could be accomplished. This is a topic that should be explored in future studies. Factors that might encourage nurse practitioners to document quality indicators for the asthma guidelines more thoroughly should be explored. A future study to determine if the complexity of the NHLBI 2007 asthma guidelines is a factor that impedes adoption by the nurse practitioners and to develop methods to improve guideline adherence based on nurse practitioner input may be of benefit.

A similar study conducted in different clinical settings might enrich information about NP perceptions and use of national standards of care, in particular the NHLBI 2007 asthma guidelines. Further research is necessary to investigate implementation of the NHLBI 2007 asthma guidelines by nurse practitioners in the general practice setting. Lack of adoption of the NHLBI 2007 asthma guidelines may lead to the presumption that outcomes for adolescents with asthma at the LCCHWC may not be ideal (Rossi, 2004). Future studies to look at specific outcomes based on the NHLBI 2007 guidelines should be considered to determine the accuracy of this presumption.

### Summary

In this chapter, patterns of practice and perceptions of practice by nurse practitioners who care for adolescents with asthma at the LCCHWC were explored in relation to the diffusion of innovation theory. Current patterns of practice of nurse practitioners in providing care to adolescents with asthma were compared to the NHLBI 2007 asthma guidelines. Nurse practitioners addressed all components of the process of care recommended by the AANP (2007)

which includes assessment, diagnosis, development and implementation of a treatment plan, and evaluation of the patient status. Comparison of the current patterns of practice in providing care to adolescents with asthma revealed partial adoption of the NHLBI 2007 asthma guidelines. Nurse practitioners achieved the knowledge, persuasion, and decision stages of dissemination, but did not fully achieve the implementation and confirmation stages of dissemination. While the five attributes of innovation were not directly addressed by the interview questions, relative advantage and observability were factors that promoted adoption of the NHLBI 2007 asthma guidelines, and complexity was considered a factor that possibly impeded adoption of the guidelines. It was not possible to determine if compatibility or trialability impeded or promoted adoption of the guidelines. In addition, chapter five addressed strengths and limitations of the study and explored implications for nursing practice such as barriers to using standards of care, importance of asthma education in providing care to adolescents with asthma, and promoting active dissemination of the asthma guidelines.

This study establishes a baseline measure of adoption of the NHLBI 2007 asthma guidelines by nurse practitioners at the LCCHWC (Donaldson, et al., 2004). Rossi (2004), states that a well implemented program could be considered “presumptive evidence” (Rossi, 2004, p. 57) that the expected outcomes are produced as well. Evidence of uptake of the NHLBI 2007 asthma guidelines determined by achievement of the decision stage of the diffusion of innovation should serve as a starting point to evaluate future use of the guidelines in clinical practice and patient outcomes (Donaldson, et al., 2004; Rossi, 2004). In conclusion, nurse practitioners are “ideally prepared and positioned” (Goolsby, 2004, p. 104) to support implementation of evidence-based practice to provide best possible patient outcomes.

APPENDIX A: SUMMARY OF DATABASE SEARCHES

EBM Database Searches Through The University of Arizona (conducted Summer 2008, updated April and August 2009)

Keywords:

Adolescents, chronic disease and health beliefs  
 Adolescents, chronic disease, and asthma  
 Adolescents and chronic disease  
 Adolescents and health beliefs  
 Adolescents, asthma, and behavior  
 Teaching and adolescents  
 Adolescents and cognitive development  
 Adolescents and learning patterns  
 Advanced practice nurses and standards of care  
 Advanced practice nurses and standards of care and asthma  
 National asthma guideline and advance practice nurse  
 Nurse practitioner and patterns of practice  
 Nurse practitioners and standards of care  
 Nurse practitioner and evidence based practice

Cinahl, Medline and Pubmed Database searches through Texas Tech University Health Sciences Center and The University of Arizona (conducted Summer 2008, updated April and August 2009)

Keywords:

Adolescents and asthma and health beliefs  
 Adolescents and chronic disease  
 Teaching and Adolescents  
 Adolescents and learning styles  
 Adolescents and learning behaviors  
 Adolescent development  
 Measuring asthma knowledge  
 Asthma knowledge tool  
 Asthma and knowledge and questionnaire  
 Adolescent and knowledge and asthma  
 Advanced practice nurses and standards of care  
 Advanced practice nurses and standards of care and asthma  
 National asthma guideline and advance practice nurse  
 Nurse practitioner and patterns of practice  
 Nurse practitioners and standards of care  
 Nurse practitioner and evidence based practice

Google (conducted Summer 2008, updated April and August 2009)

Keywords:

Adolescent and adherence and asthma  
 Adolescent and knowledge and asthma  
 Nurse practitioners and standards of care  
 National asthma guideline and advance practice nurse

APPENDIX B: INSTITUTIONAL REVIEW BOARD APPROVALS



Human Subjects  
Protection Program

1618 E. Helen St.  
P.O. Box 245137  
Tucson, AZ 85724-5137  
Tel: (520) 626-6721  
<http://www.irb.arizona.edu>

### HSPP Correspondence Form

Date: 10/12/09

Investigator: Wendy Renee Thal, DNP Candidate

Department: Nurs

Project No./Title: 09-0878-00 Use of Standards of Care by Nurse Practitioners in Providing Care to Adolescents' with Astham at an Academic Nurse Managed Primary Care Clinic

Current Period of Approval: 10/12/09 – no expiration

IRB Committee Information	
<input checked="" type="checkbox"/> Administrative Action FWA Number: FWA00004218	<input checked="" type="checkbox"/> Administrative/Exempt Review – 10/12/09
Nature of Submission	
<input checked="" type="checkbox"/> New Project	
Documents Reviewed Concurrently	Appr: Approved Ack: Acknowledged Rev: Reviewed
<input checked="" type="checkbox"/> Project Review Form (received 9/08/09)	Appr
<input checked="" type="checkbox"/> Consenting Instruments: Subject Consent Form Re-consent: <input type="checkbox"/> All <input type="checkbox"/> Current Only <input checked="" type="checkbox"/> Not Required	Appr
<input checked="" type="checkbox"/> VOTF	Appr
<input checked="" type="checkbox"/> Recruitment Materials: Email	Appr
<input checked="" type="checkbox"/> Questionnaires/Surveys: Data Collection Instruments and Code Books Survey and Semi-Structured Interview Guide	Appr
<input checked="" type="checkbox"/> Site Authorization: Larry Combest Community Health and Wellness Center	Appr
Committee/Chair Determination	
<input checked="" type="checkbox"/> Approved as submitted effective 10/12/09	
Additional Determination(s)	

- **Exempt Approval 45 CFR 46.101(b)(2):** Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior.
- **Exempt Approval 45 CFR 46.101(4):** Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

*Elizabeth A. Boyd*

10/12/09

Elizabeth A. Boyd, Ph.D. Date  
Assistant Vice-President, Research Compliance & Policy  
Office for the Responsible Conduct of Research

EAB:mm

Cc: Departmental/College Review Committee

**Reminders:** Continuing Review materials should be submitted 30–45 days prior to the expiration date to obtain project re-approval

- Projects may be concluded or withdrawn at any time using the forms available at [www.irb.arizona.edu](http://www.irb.arizona.edu).
- No changes to a project may be made prior to IRB approval except to eliminate apparent immediate hazard to subjects.
- Original signed consent forms must be stored in the designated departmental location determined by the Department Head.







**INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS**  
**FWA # 00006767                      LUBBOCK/ODESSA IRB #00000096**

**NOTIFICATION OF INITIAL APPROVAL**

August 31, 2009

**IRB #:** L09-144

**STUDY #:** Use of Standards of Care by Nurse Practitioners in Providing Care to Adolescent's with Asthma at an Academic Nurse Managed Primary Care Clinic (1234)

**PRINCIPAL INVESTIGATOR:** Wendy Thal, MSN

**SUBMISSION REFERENCE #:** 028963

**TYPE OF REVIEW:** EXPEDITED

**APPROVAL DATE:** 08/31/2009

**RISK ASSIGNMENT:** Expedited/Minimal

**REVIEW PERIOD:** 12 Months

**EXPIRATION DATE:** 08/30/2010  
*(based upon date recommended for approval)*

**NUMBER OF SUBJECTS AT THIS SITE:** 10

**SPECIFIC INFORMATION PERTAINING TO THIS APPROVAL**

**Documents reviewed and approved include:**

Application  
 Project Protocol  
 Informed Consent version date 8/17/2009  
 HIPAA Waiver  
 Site Authorization Letter  
 Nurse Practitioner Recruitment Email  
 Data Collection Instruments and Code Book

**Recommendation:** Approval at the Expedited Category 45 CFR 46.110(5, 6 &7) with an annual review.

**Approval Period:** This approval is for a period of 12 Months. You should receive electronic notification 30 days prior to the expiration of this project's approval. *However, it is your responsibility to insure that a Continuing Review Submission Form has been submitted by the required time.*

**Consent Form:** The currently approved and stamped consent form must be used when enrolling subjects. You are responsible for maintaining signed consent forms for a period of at least three years after study completion.

**Reporting:** The principal investigator must report to the IRB any serious problem, adverse effect, or outcome that occurs with frequency or degree of severity greater than that anticipated. In addition, the principal investigator must report any event or series of events that prompt the temporary or permanent suspension of a research project involving human subjects.

APPENDIX C: SITE AUTHORIZATION LETTER



301 40<sup>th</sup> Street  
Lubbock, TX 79404  
Phone: 806-743-9393 ext 242  
Fax: 806-743-9363

August 4, 2009

Wendy Renee Thal  
3601 4<sup>th</sup> Street, MS 6264  
Lubbock, Texas 79430

Dear Mrs. Thal:

I have reviewed your request regarding your study and am pleased to support your research project entitled "*Use of Standards of Care by Nurse Practitioners in Providing Care to Adolescent's with Asthma at an Academic Nurse Managed Primary Care Clinic*". Your request to use the Larry Combest Community Health and Wellness Center as a research or recruitment site is granted. The research will include a retrospective chart review and individual interviews conducted with the nurse practitioners from the Larry Combest Community Health and Wellness Center. This authorization covers the time period of August 1, 2007 to December 31, 2009. We look forward to working with you.

Sincerely,

Linda McMurry, MSN, RN  
Executive Director  
Larry Combest Community Health and Wellness Center  
301 40<sup>th</sup> Street, MS 7425  
Lubbock, Texas 79404  
806-743-9393 ext 242

APPENDIX D: INFORMED CONSENT FORMS

APPROVED BY UNIVERSITY OF AZ IRB.  
THIS STAMP MUST APPEAR ON ALL  
DOCUMENTS USED TO CONSENT SUBJECTS.  
DATE: 10/12/09 \_\_\_\_\_

## Informed Consent

Use of Standards of Care by Nurse Practitioners in Providing Care to  
Adolescent's with Asthma at an Academic Nurse Managed Primary Care Clinic

### Introduction

You are being invited to take part in a research study. The information in this form is provided to help you decide whether or not to take part. Study personnel will be available to answer your questions and provide additional information. If you decide to take part in the study, you will be asked to sign this consent form. The Principal investigator (PI) will give a copy of this form to you.

### What is the purpose of this research study?

The purpose of this study is to explore perceptions of practice by nurse practitioners who care for adolescents with asthma at the Larry Combest Community Health and Wellness Center.

### Why are you being asked to participate?

You are being invited because you are a nurse practitioner who has provided care to patients at the Larry Combest Community Health and Wellness Center during the time frame August 1<sup>st</sup>, 2007 until August 1<sup>st</sup>, 2009.

### How many people will be asked to participate in this study?

Approximately 10 persons will be asked to participate in this study.

### What will happen during this study?

Once you have agreed to participate in the study, you will sign this informed consent form. The PI will arrange a meeting at your convenience and location of choice for completion of a short survey and interview. The interview will be held in a private location to assure confidentiality and audio taped for later transcription. Your name will appear on the consent, and then a code name will be assigned for tapes and transcription. To assure accuracy, after completion of transcription, the PI will share the transcript with you. If you want to correct wording, the PI will cross through words you want revised and will write your corrected wording.

### How long will I be in this study?

The interview will probably take up to 60 minutes.

**Are there any risks to me?**

There is a minimal risk of exposure or a breach of confidentiality due to the small number of health care providers in the clinic setting. Although we have tried to avoid risks, you may feel that some questions we ask you may be stressful. If this occurs you can stop participating immediately. We can give you information about individuals who may be able to help you with discussion of your concerns.

**Are there any benefits to me?**

You will not receive any benefit from taking part in this study.

**What are the alternatives for participating in this study?**

This study does not involve treatment. The alternative is not to participate in this study.

**Will there be any costs to me?**

Aside from your time, there are no costs for taking part in the study.

**Will I be paid to participate in the study?**

The PI will give you a \$10 gift card to an area restaurant as gratuity for participating in the study.

**Will video or audio recordings be made of me during the study?**

We will make an audio recording during the study so that we can be certain that your responses are recorded accurately only if you check the first box below:

I give my permission for an audio recording to be made of me during my participation in this research study.

I do not give my permission for an audio recording to be made of me during my participation in this research study.

**Will the information that is obtained from me be kept confidential?**

The only persons who will know that you participated in this study will be the Principal Investigator and research personnel. Your records will be confidential. Information that may identify any one individual will be blended to create a composite for confidentiality as findings from this study are reported. All participants will be assigned an Identification Number and this number will be used on all data. Names and other identifying information will not be included in reports or publications. It is

possible that representatives of the sponsor that supports the research study will want to come to The University of Arizona to review your information. Representatives of regulatory agencies including The University of Arizona Human Subjects Protection Program may access your records.

**What if I am harmed by the study procedures?**

This study involves minimal risk to you or your health. In the event of research related illness or injury, consult your regular health care provider.

**May I change my mind about participating?**

Your participation in this study is voluntary. You may decide to not begin or to stop the study at any time. **Your refusing to participate will have no effect on you or your employment.**

**Whom can I contact for additional information?**

You can call the Principal Investigator to tell her about a concern or complaint about this research study. You may call the Principal Investigator, Wendy Thal, DNP candidate at (806) 773- 4905. If you have questions about your rights as a research subject you may call the University of Arizona Human Subjects Protection Program office at (520) 626-6721. If you have questions, complaints, or concerns about the research and cannot reach the Principal Investigator; or want to talk to someone other than the Investigator, you may call the University of Arizona Human Subjects Protection Program office. (If out of state use the toll-free number 1-866-278-1455.) If you would like to contact the Human Subjects Protection Program via the web (this can be anonymous), please visit <http://www.irb.arizona.edu/contact/>.

**Your Signature**

By signing this form, I affirm that I have read the information contained in the form, that the study has been explained to me, that my questions have been answered and that I agree to take part in this study. I do not give up any of my legal rights by signing this form.

-----  
Name (Printed)

-----  
Participant's Signature

-----  
Date signed

**Statement by person obtaining consent**

I certify that I have explained the research study to the person who has agreed to participate, and that he or she has been informed of the purpose, the procedures, the possible risks and potential benefits associated with participation in this study. Any questions raised have been answered to the participant's satisfaction.

-----  
Name of study personnel

-----  
Study personnel Signature

-----  
Date signed



*This form is not valid without the TTUHSC IRB seal on the bottom of each page.*

**CONSENT TO TAKE PART IN A RESEARCH STUDY**  
Signed copy to be provided to subject or authorized representative

This is a research study for subjects who voluntarily choose to take part. Please take your time to make a decision, and discuss the study with your family and friends if you wish.

**STUDY TITLE:** **STUDY TITLE:** Use of Standards of Care by Nurse Practitioners in Providing Care to Adolescent's with Asthma at an Academic Nurse Managed Primary Care Clinic

**INVESTIGATOR(S) and CONTACT TELEPHONE NUMBER(S):** Wendy Thal RN, MSN, FNP-C: 806-743-2730 extension 350 or 806-773-4905

**INSTITUTION:** Larry Combest Community Health and Wellness Center, TTUHSC

1. **Why is this study being done?** The purpose of this inquiry is to explore patterns of practice and perceptions of practice by the nurse practitioners who care for adolescents with asthma, and to evaluate the current patterns of practice in comparison with national standards for providing care to adolescents with asthma the Larry Combest Community Health and Wellness Center. Both a review of medical records of adolescents with asthma and interviews with nurse practitioners providing care to adolescents with asthma at the Larry Combest Community Health and Wellness Center will be used to answer these questions. Data will be reported as an aggregate only. Your patterns of practice will not be compared with that of other nurse practitioners at the Larry Combest Community Health and Wellness Center. Use of the national asthma guidelines at least 70% of the time during interaction with adolescents with asthma in the clinic setting by the providers will be used to reflect adoption of the guidelines.
2. **What will happen during this study?** Once you have agreed to participate in the study, you will sign this informed consent form. The PI will arrange a meeting at your convenience and location of choice for completion of a short survey and interview. The interview will be held in a private location to assure confidentiality and audio taped for later transcription. Your name will appear on the consent, and then a code name will be assigned for tapes and transcription. To assure accuracy, after completion of transcription, the PI will share the transcript with you. If you want to correct wording, the PI will cross through words you want revised and will write your corrected wording. The audio tapes will be kept until completion of the study in January 2010 and will then be destroyed by shredding.
3. **How much time will this study take?** The interview will probably take up to 60 minutes including the time to discuss and questions or concerns you may have about this study.
4. **What are the risks or discomforts to me if I join this study?** Due to this project being conducted from a small population base, a possible risk for participating is that other health care providers may learn of your involvement in the project. This may be a potential cause of distress or embarrassment to you. All meetings will be at a time and location of your choosing to decrease possible exposure to other clinic providers. There is a potential that some questions may be stressful or to you. As data is reported as an aggregate only, there is no potential for negative effects on future employment evaluations. You may stop the interview at any time. We can give you information about individuals who may be able to help you with discussion of your concerns.
5. **Are there any benefits to me if I take part in this study?** You will not receive any benefit from taking part in this study.
6. **What other choices do I have if I don't take part in the research study?** Taking part in this study is your choice. You do not have to take part in this study. If at any time you decide not to be in the study, it will not affect any benefits or rights to which you are entitled.



Texas Tech University HSC  
IRB NUMBER: L09-144  
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IRB EXPIRATION DATE: 8/30/2010

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Subject/AR Initials \_\_\_\_\_  
Version date 10/13/2009

APPENDIX E: DATA COLLECTION INSTRUMENT (NPUQI) – QUESTION 1

Nurse Practitioner Use of Quality Indicators in Providing Care to Adolescents with Asthma (NPUQI)

Provider Identifier:

Did the provider record assessment of these?	Patient Encounter	Patient Encounter	Patient Encounter	Patient Encounter
<b>PATIENT DEMOGRAPHICS</b>				
Gender				
Ethnicity				
Insurance				
<b>ASSESSMENT OF HEALTH STATUS</b>				
Vital signs				
Quality of life				
Number of times rescue inhaler used per week				
Physical examination				
Past medical history				
History of smoking				
<b>DIAGNOSIS</b>				
Pulmonary function				
Number of days per week with symptoms				
Number of nights per week with symptoms				
Triggers				
Asthma questionnaire				
Asthma classification				

DEVELOPMENT & IMPLEMENTATION OF TREATMENT PLAN				
Provided/reviewed asthma action plan				
Provided asthma education				
Prescribed controller				
Prescribed rescue				
Frequency of follow up visits				
EVALUATION OF PATIENT STATUS				
ER /urgent care use since last clinic visit				
Number of exacerbations since last visit				
Missed days of school/work since last visit				
Pulseoximetry				
Adherence to Pharmacotherapy				
Comments:				

References: NHLBI, 2007; LCCHWC, n.d.

APPENDIX F: DATA COLLECTION INSTRUMENT (UNAG) – QUESTION 2

Perceptions of Nurse Practitioners on Use of National Asthma Guidelines in Providing Care to Adolescents with Asthma Survey and Semi- Structured Interview Guide (UNAG)

**Provider Demographics**

Age range:  
Ethnicity:  
Level of education:  
Specialty:  
Years in practice:  
Years at LCCHWC:  
Languages Spoken:

**General Questions**

**Instructions:**

**For Question 1: Circle the letter corresponding to each response that applies to you:**

1. What resources do you use when developing a plan of care for an adolescent with asthma?
  - A. Medical and/or nursing textbooks
  - B. Peer reviewed journals
  - C. Internet
  - D. National Heart, Lung, and Blood Institute (NHLBI) 2007 asthma guidelines

**For Questions 2 though 8: Circle only one response:**

2. Have you previously heard of the NHLBI, 2007 Asthma guidelines?
  - A. Yes
  - B. No
3. When did you first hear about the NHLBI, 2007 asthma guidelines?
  - A. August 2007- January 2008
  - B. February 2008- July 2008
  - C. August 2008 – January 2009
  - D. February 2009- July 2009
4. How did you first hear about the NHLBI 2007 asthma guidelines?
  - A. From a LCCHWC colleague
  - B. From a non-LCCHWC colleague
  - C. Email notice
  - D. Mailed newsletter
  - E. Journal article
  - F. Professional conference
  - G. other
5. How would you describe your level of comfort in using the National Heart, Lung, Blood Institute, 2007 guidelines for asthma in providing care to adolescents with asthma?
  - A. Totally comfortable
  - B. Mostly comfortable
  - C. Slightly comfortable
  - D. Not at all comfortable

6. How important do you consider the use of standards of care in practice to be in providing care to adolescents with asthma?
- A. Extremely important
  - B. Quite important
  - C. Somewhat important
  - D. Not important
7. What percentage of time do you believe you use the national standards of care in providing care to adolescents with asthma at their clinic visits?
- A. 75-100%
  - B. 50-74%
  - C. 26-49%
  - D. Less than 25%
8. How often would you recommend follow up for an adolescent with moderate, controlled asthma?
- A. Less than once a month
  - B. Once a month
  - C. Every 3 months
  - D. Every 6 months
  - E. Once a year

### **Targeted Questions**

#### **Assessment of Health Status:**

Describe the steps you would use to assess an adolescent presenting to the clinic with SOB, wheezing and cough?

What information do you consider of greatest importance in determining a diagnosis of asthma?

#### **Diagnosis:**

What criteria do you use to diagnose an adolescent with asthma?

#### **Development and Implementation of Treatment Plan:**

What are your priorities in developing a plan of care for an adolescent with asthma?

#### **Evaluation of Patient Status:**

How do you monitor outcomes for adolescents with asthma?

APPENDIX G: CODE BOOK (NPUQI) – QUESTION 1



## Patient Demographics:

Variable	Defined as:	Assigned Coding
Gender	Documentation of gender on patient demographic record in record	0= Male 1= Female
Ethnicity	Documentation of race on patient demographic record in record	0= Caucasian 1= Hispanic 2= African American 3= American Indian 4= Asian 3= Other Race
Insurance	Documentation of insurance on patient demographic record in record	0= Private Pay 1= Private Insurance 2= CHIP 3= Medicaid

## Assessment of Health Status:

Variable	Defined as:	Assigned Coding
Vital Signs	Presence of T/P/R and BP	0= No 1= Yes 9= Missing Data
Quality of Life	Documentation of limitations on activities or documentation of indication of verbal satisfaction with QOL	0= No 1= Yes 9= Missing Data
Use of Quick Acting Inhaler	Documentation of number of times rescue inhaler is being used per week	0= No 1= Yes 9= Missing Data
Physical Examination	Documentation of complete respiratory assessment	0= No 1= Yes 9= Missing Data
Past Medical History	Did the provider complete PMH or update previous PMH	0= No 1= Yes 9= Missing Data
History of Smoking	Did the provider record asking the adolescent about smoking?	0= No 1= Yes 9= Missing Data

## Diagnosis:

Variable	Defined as:	Assigned Coding
Pulmonary Function	Assessment of spirometry or peak flow at the initial visit and/or annually	0= Not Required 1= Spirometry 2= Peak flow 9= Missing Data

Number of days per week with symptoms	Documentation of how many days per week the adolescent has symptoms	0= No 1= Yes 9= Missing Data
Number of nights per week with symptoms	Documentation of how many nights per week the adolescent has symptoms	0= No 1= Yes 9= Missing Data
Triggers	Assessment of asthma triggers noted on the record	0= No 1= Yes 9= Missing Data
Asthma Questionnaire	Noted on record at each visit	0= Not Required 1= Initial Visit 2= Follow Up visit 9= Missing data
Asthma Classification	Did the provider determine the classification of severity of asthma at each visit	0= No 1= Yes 9= Missing Data

Development and Implementation of Treatment Plan:

Variable	Defined as:	Assigned Coding
Asthma Action Plan	Was an asthma action plan initiated or reviewed with the adolescent?	0= None 1= Initiated 2= Reviewed
Asthma Education	Was the adolescent provided with written or verbal asthma education or was previous education reinforced?	0= None 1= Written 2= verbal 3= Reinforced previous education
Pharmacotherapy-Controller	Was a controlled medication ordered?	0= None 1= SABA only 2= SABA and ICS 3= SABA, ICS, and LABA (or combination ICS and LABA) 4= ICS only 5= LABA only 6= LTRA only 7= Theophylline
Pharmacotherapy-Quick Acting	Was a quick acting medication ordered?	0= None 1= SABA 2= Anticholinergic 3= Oral Corticosteroid

Follow Up Visits	Was a follow up visit recommended and at what frequency?	0= None 1= 3 months 2= 6 months 3= 1 year 4= other
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Evaluation of Patient Status:

Variable	Defined as:	Assigned Coding
ED or Urgent Care Visits	Documentation of use of ED or urgent care since previous visit?	0= No 1= Yes 2= Not Required 9= Missing Data
Exacerbations	Documentation of number of exacerbations since last visit?	0= No 1= Yes 2= Not Required 9= Missing Data
Missed Days of School/Work	Documentation of missing days of school or work since last visit?	0= No 1= Yes 2= Not Required 9= Missing Data
Pulseoximetry	Was pulseoximetry used during the visit?	0= No 1= Yes 2= Not Required 9= Missing Data
Adherence to Pharmacotherapy	Documentation of verbal feedback on adherence to medications or record of refills	0= No 1= Yes 9= Missing Data

APPENDIX H: CODE BOOK (UNAG) – QUESTION 2

## Code Book for Provider Demographics

Variable	Defined As:	Assigned Coding
Age Range	Age range as stated by provider	0= Under 30 years of age 1= 31 to 39 years of age 2= 40 to 49 years of age 3= 50 years and over
Ethnicity	Race as defined by provider	0= Caucasian 1= Hispanic 2= African American 3= American Indian 4= Asian 3= Other Race
Level of Education	Level of education as defined by provider	0= MSN 1= Doctoral
Specialty	Advanced practice specialty as defined by provider	0= Family Nurse Practitioner 1= Pediatric Nurse Practitioner 2= Adult Nurse Practitioner
Years in Practice	Years in Practice as defined by provider	0 = Less than 1 year 1= 1 to 2 years 2= 3 to 5 years 3= 6 to 10 years 4= greater than 10 years
Years at LCCHWC	Years at LCCHWC as defined by provider	0 = Less than 1 year 1= 1 to 2 years 2= 3 to 5 years 3= 6 to 10 years 4= greater than 10 years
Language	Language fluency of provider	0= English Only 1= English and Spanish 2= Other

APPENDIX I: EXPERT CONTENT REVIEWER FORM (NPUQI)

Expert Content Reviewer: \_\_\_\_\_ Date: \_\_\_\_\_

Nurse Practitioner Use of Quality Indicators in Providing Care to Adolescents with Asthma  
Expert Content Review (NPUQI)

AANP Standard of Care: Assessment of Health Status

Reflects Component 1 of the NHLBI Guidelines: Measures of Asthma Assessment and Monitoring

<i>Did the Provider document assessment of these?</i>	Quality Indicator	Defined as documentation of:	Item Reflects Quality Indicator	
			Yes	No
	Vital Signs	T/P/R and BP		
	Quality of Life	Limitations on activities or documentation of indication of verbal satisfaction with QOL		
	Use of Quick Acting Inhaler	Number of times rescue inhaler is being used per week		
	Physical Examination	Respiratory assessment		
	Past Medical History	Provider completing (PMH) or updating previous (PMH)		
	History of Smoking	Patient history of smoking		

AANP Standard of Care: Diagnosis

Reflects Component 1 of the NHLBI Guidelines: Measures of Asthma Assessment and Monitoring

<i>Did the Provider document assessment of these?</i>	Quality Indicator	Defined as documentation of:	Item Reflects Quality Indicator	
			Yes	No
	Pulmonary Function	Assessment of spirometry or peak flow at initial visit or annually		
	Number of days per week with symptoms	How many days per week the adolescent has symptoms		
	Number of nights per week with symptoms	How many nights per week the adolescent has symptoms		
	Triggers	Assessment of asthma triggers noted on the chart		
	Asthma Questionnaire	An asthma questionnaire		
	Asthma Classification	Classification of severity of asthma?		

AANP Standard of Care: Development and Implementation of Treatment Plan

Reflects Component 2 of the NHLBI Guidelines: Education for a Partnership in Asthma Care, Component 3: Control of Environmental Factors and Co-morbid Conditions That Affect Asthma and Component 4: Medications

<i>Did the Provider document assessment of these?</i>		Item Reflects Quality Indicator	
Quality Indicator	Defined as documentation of:	Yes	No
Written Asthma Action Plan	A written asthma action plan		
Asthma Education	Written or verbal asthma education		
Pharmacotherapy- Controller	A controller medication ordered		
Pharmacotherapy- Quick Acting	A quick acting medication ordered		
Follow Up Visits	A follow up visit recommendation and at what frequency		

AANP Standard of Care: Evaluation of Patient Status

Reflects Component 1 of the NHLBI Guidelines: Measures of Asthma Assessment and Monitoring

<i>Did the Provider document assessment of these?</i>		Item Reflects Quality Indicator	
Quality Indicator	Defined as documentation of:	Yes	No
ED or Urgent Care Visits	Use of ED or urgent care since previous visit		
Exacerbations	Number of exacerbations since last visit		
Missed Days of School/Work	Missing days of school or work since last visit		
Pulseoximetry	Pulseoximetry value		
Adherence to Pharmacotherapy	Verbal feedback on adherence to medications or record of refills		

References: NHLBI, 2007; LCCHWC, n.d.

Comments:



APPENDIX J: CONTENT ANALYSIS (UNAG) SECOND CODER RESPONSE  
INSTRUCTION SHEET

## UNAG Interviews

## Content Analysis - Coder Instructions

The left hand column may be disregarded as it serves only as a tracking mechanism to determine agreement. The middle column labeled “Key Words/Phrases” are the individual data bits. The right hand column has numbers 1 to 39 for your coding purposes. Please select the most appropriate coding label from the list supplied. If none of the coding labels seem to fit, you may rename or mark as no label applies. The coding label list is in alphabetical order. I would suggest spending a few moments to familiarize yourself with the coding terminology before beginning coding. Please return the completed coding form to me via email. If you have any questions please let me know!

Thank you- Wendy

[wendy.thal@ttuhsc.edu](mailto:wendy.thal@ttuhsc.edu)

APPENDIX K: RECRUITMENT LETTER AND EMAIL

## Recruitment Email

Dear Colleague-

As you are aware, I am a Doctorate of Nursing Practice candidate at the University of Arizona, College of Nursing. As part of my degree requirements, I am the principal investigator in a research study that involves nurse practitioner care of adolescent patients with asthma at the Larry Combest Community Health and Wellness Center. The purpose of this study is to explore perceptions of practice by nurse practitioners who care for adolescents with asthma at the Larry Combest Community Health and Wellness Center.

You are invited to take part in this research study. You are invited because you are a nurse practitioner who has provided care to patients at the Larry Combest Community Health and Wellness Center during the time frame August 1<sup>st</sup>, 2007 until August 1<sup>st</sup>, 2009. Participation is voluntary. You may convey your interest in participating in this study by responding to respond to this email and your response will be held confidential by this investigator. If you agree to participate in the study, I will arrange a meeting at your convenience and location of your choice to discuss and obtain informed consent for this study. The study will involve a short survey and interview and will require not more than 60 minutes of your time. I appreciate your time and attention to my request.

Sincerely,

Wendy Thal  
DNP Candidate

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