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Patricia A. Foster-Staples

University of Missouri-St. Louis, pafwyb@mail.umsel.edu

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Implementation of the National Asthma Guidelines in a Residential Pediatric Clinic

Pat A. Foster-Staples, MSN, RN, CPNP

MSN, PNP, Nursing, University of Missouri-St. Louis, 1999

BSN, Nursing, Webster University-St. Louis, 1995

Diploma of Nursing, Jewish School of Nursing, 1982

A Dissertation Submitted to The Graduate School at the University of Missouri-St. Louis

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Advisory Committee

Roxanne Vandermause, PhD, RN

Chairperson

Laura L. Kuensting, DNP, APRN, PCNS-BC, CPNP, CPEN

Nancy Magnuson, DSN, CS, FNP-BC

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## Abstract

**Purpose:** Foster care children admitted to residential facilities are a unique and vulnerable group, many presenting with undiagnosed or poorly managed asthma. The alarming rate of residents admitted to a particular residential primary care clinic with a diagnosis of asthma led to the project question: “Based on record reviews, does staff education about the importance of utilizing the national guidelines for asthma education influence the implementation of such guidelines in a residential pediatric clinic?” The purpose of this quality improvement project was to implement a systematic process to influence practice change. The project was conducted over a period of 4 weeks.

**Design:** The project was a single-group pretest-posttest design. The medical records were examined prior and post National Asthma Guidelines, Expert Panel Report-3 (EPR-3, 2007) education to determine whether guidelines had been implemented. A convenience sample consisted of male and female residents, 12-17 years of age, admitted to the clinic with a diagnosis of asthma or any resident having experienced any asthma symptoms. Twenty-nine children’s records ( $n=29$ ) were studied.

**Findings:** The composite review of documented asthma guidelines was significantly higher post-intervention ( $M=3.96$ ,  $SD=1.81$ ) than pre-intervention ( $M=1.34$ ,  $SD=1.54$ ),  $t(28)=7.99$ ,  $p<0.05$  for all measured variables. A large effect size was noted.

**Conclusion:** Implementing national asthma guidelines encouraged best-practice for the residential facility and improved asthma care for a transient high-risk population. The literature review demonstrated a lack of data regarding pediatric primary care clinics in residential facilities.

**Implications:** This study provided important information about implementing evidence-based practice. Larger studies are needed in the future.

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## Introduction

### Background and Significance

In 2014, the Adoption and Foster Care Analysis and Reporting System (AFCARS, 2015) noted that more than 400,000 children were removed from their families and placed in foster care. Children are placed in the foster care system due to abandonment, abuse, parental inability to care for them, neglect, and homelessness (Deutsch & Fortin, 2015; McDavid, 2015). Children placed in foster care demonstrate a high prevalence of chronic physical health conditions (35-45%) and mental health challenges (40-95%) due to the fragmented health care received and the frequent home placement disruptions (The American Academy of Pediatrics [AAP], 2015; Deutsch & Fortin, 2015; Hayes, Geiger, & Lietz, 2015; Maher, Darnell, Landsverk, & Zhang, 2015; Scribano, 2015; Szilagyi, Rosen, Rubin, & Zlotnik, 2015). The more prevalent chronic medical conditions seen in foster children include asthma, severe allergies, obesity, and neurological complications that require evaluation and ongoing treatment (Kiwauka, Boyar, & Jensen, 2013; Maher et al., 2015; Forkey & Szilagyi, 2014). Scribano (2015) described the children and adolescents in foster care as a unique population due to their vast number of health disparities including behavioral and developmental health challenges requiring greater utilization of health care services than the general population. It is not uncommon for children with chronic conditions (such as asthma) to enter the foster care system or transition from a previous placement with incomplete health histories and without their medications (Forkey & Szilagyi, 2014; Greiner, Ross, Brown, Beal, & Sherman, 2015). The caregiver may not understand the foster child's illness or medical needs, and will often seek medical care in an emergency department

(Forkey & Szilagyi, 2014; Greiner et al., 2015). The difficulty in providing optimal health care for the children in foster care adds to the cascade of worsening health outcomes on the tax system (Deutsch & Fortin, 2015; Forkey & Szilagyi, 2014). Providing evidence-based clinical practice for the treatment of chronic illnesses such as asthma is essential to providing high-quality health care and improving health care outcomes for this population (AAP, 2015; Deutsch & Fortin, 2015; Scribano, 2015).

Foster care placements include, but are not limited to, pre-adoptive homes, foster family homes (relative and non-relative), group homes, residential facilities, and supervised independent living according to AFCARS (2015) and the Child Welfare Information Gateway (2015). The Child Welfare Information Gateway (2013) is a congressionally mandated service of the US Children's Bureau that provides access to databases and statistics on adoption, child abuse, and neglect, and child welfare/foster care. The Centers for Disease Control and Prevention (CDC, 2016) estimated that one out of every eleven children (8.6%) has asthma. The children in foster care are reported as having a disproportionately higher prevalence of asthma than that reported in similar groups of children in the United States (Deutsch & Fortin, 2015; Maher et al., 2015).

Asthma is a chronic lung disease that affects the health of an estimated 6.3 million children less than 18 years of age in the United States (U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics [NCHS], 2016; U.S. Environmental Protection Agency [EPA], 2016). In 2009, approximately one in ten children (10%) had asthma according to the NCHS (2011) and the National Institute of Allergy and Infectious Diseases (2012). The specific data regarding hospitalizations and emergency department visits for foster children with



asthma is limited. However, the most recent national data has noted that asthma accounted for an estimated 439,000 hospitalizations, more than 1.8 million asthma-related emergency department visits and 10.5 million missed days from school costing the nation approximately \$56 billion each year (EPA, 2016; NCHS, 2016). The CDC (2016) and the NCHS (2016) reported that the asthma rate for children in 2014 had decreased (8.6%). According to the CDC (2016) asthma continues to affect low-income populations (below the Federal poverty level) with increased prevalence rates of 10.4%, and as high as 16.5% for Puerto Ricans. However, the children in foster care are a unique population having an asthma prevalence of 17% (Deutsch & Fortin, 2015; Maher et al., 2015). The children in foster care with chronic illnesses (such as asthma) are at-risk, partly, due to the same factors that brought them into the child welfare system (Blaakman, Cohen, Fagnano, & Halterman, 2014; Kiwanuka, Boyar, & Jensen, 2013; Szilagyi et al., 2015). Children are placed in the foster care system for many reasons: abuse, neglect, abandonment, or parental inability to care for them (Casanueva, Tueller, Dolan, Smith, & Ringeisen, 2012; McDavid, 2015; Szilagyi et al., 2015)

### **Statement of Purpose**

The National Asthma Guidelines, Expert Panel Report-3 (EPR-3) was utilized as recommended by the U.S. Department of Health and Human Services and the National Institute of Health. The EPR-3 provides asthma management guidance for selecting treatment based on the child's individual needs and for maintaining treatment based on the level of asthma control (The National Heart, Lung, and Blood Institute [NHLBI], 2013). Asthma control focuses on two domains: (1) reducing impairment: the frequency and intensity of symptoms and functional limitations currently or recently experienced by

a patient; and (2) reducing risk: the likelihood of future asthma attacks, reduced lung growth in children, or medication side effects. The intent of this project was to encourage best-practice and determine the challenges and barriers involved in providing evidence-based clinical practice for asthma care.

The problem, intervention, comparison, and outcome (PICO) question addressed in this project was: *Based on record reviews, does staff education about the importance of utilizing the national guidelines for asthma education, influence the implementation of such guidelines in a residential pediatric clinic?*

## **Review of Literature**

### **National Guidelines**

Congress enacted the Fostering Connections Act of 2008 (PL 110-351) requiring states to set up systems to manage the health care of children in foster care according to the American Bar Association Center on Children and the Law (ABA, 2011) and Szilagyi et al. (2015). Most states have made some progress with coordinating the health care of the children in foster care. However, Szilagyi et al. (2015) emphasized that the progress has not been substantial. The Agency for Healthcare Research and Quality (AHRQ, 2015), the AAP (2015), and the National Asthma Control Program (NACP, 2013) recommended improvement in the standards of primary health services and outcomes for children with chronic health conditions, such as asthma. Healthy People 2020 (U.S. Department of Health and Human Services, 2016) set-forth objectives that focused on increasing the proportion of persons who receive appropriate asthma care according to the National Asthma Education and Prevention Program (NAEPP) guidelines. One objective was to increase the proportion of persons with current asthma who received

written asthma management plans from a 40.5 percent baseline by their health care provider. A second objective was to increase the proportion of persons with current asthma with prescribed inhalers who received instructions on their use according to NAEPP guidelines, from the baseline of 95.9 percent. Targeted percentages for increasing written asthma action plans and providing instruction on prescribed inhalers were not presented in the data. A third objective was to increase the proportion of persons with current asthma who have had at least one routine follow-up visit in the past 12 months according to NAEPP guidelines, from the baseline of 57.2 percent to the target 60.4 percent.

The NAEPP, EPR-3 (2007) provides evidence-based practice guidelines for the diagnosis and management of asthma to help health care providers bridge the gap between current knowledge and practice (Crowder, Hanna, Carpenter, & Broome, 2015; Gardner et al., 2015; Healthy People 2020, 2016; Mold et al., 2014; Rohan et al., 2013). Studies have proven that evidence-based health care practice that includes formal patient education, patient specific care plans, and routine follow-up visits have produced positive health care outcomes such as reduced asthma morbidity and mortality rates according to the Asthma and Allergy Foundation (AAFA, n.d.), Gardner et al. (2015), and NAEPP (2013). Changes in clinical practice are dependent on primary care and other health care providers (Gardner et al., 2015; Mold et al., 2014; NAEPP, 2007; Rohan et al., 2013).

### **Residential Primary Care Clinic**

Residential clinics are licensed and regulated by the Department of Social Service, Division 35-Children's Division. An extensive search was conducted for extracting journals with the content focus on residential primary clinics. The search was

conducted utilizing CINAHL, ERIC, MEDLINE, and PsycINFO databases. The word residential care facility was the major subject heading, and it was paired with constructs such as primary care, clinic, pediatric, adolescent, and child. The literature search identified 1,431 articles. Search limiters included: academic journals, studies within the U.S., peer-reviewed, and written in English. The search was based on current literature published 2012 to 2016. The search resulted in a lack of data regarding pediatric primary care clinics in residential facilities.

The data available suggested that solo and small (2 to 5 providers) primary care practices were associated with fewer preventable hospitalizations (Casalino et al., 2014; Jerant, Fenton, & Franks, 2012; Liaw, Jetty, Petterson, Peterson, & Bazemore, 2016). Mostashari (2016) noted that small practices provide a greater level of personalization and responsiveness to patient needs. Therefore, small clinics in residential facilities could improve the care of the transient population of children in foster care. It is imperative that the population of children in foster care receives high-quality pediatric healthcare that is comprehensive, compassionate, culturally sensitive, coordinated, and specific to their over-all health needs (Forkey & Szilagyi, 2014; Hayes, Geiger, & Lietz, 2015; Szilagyi et al., 2015). Approximately half of children in residential care had chronic medical problems, such as asthma (Deutsch & Fortin, 2015; Hayes, Geiger, & Lietz, 2015; Szilagyi et al., 2015). Routine office visits for asthma are highly recommended and are paramount for effective asthma management and control, asthma-related hospital stays. Emergency department visits may indicate the existence of poorly controlled asthma and serve as a marker for increased risk of future asthma exacerbation (NACP, 2013; NAEPP, 2007). The AAP (2015), the AHRQ (2015), and the NACP (2013)

recommended that each clinical contact with a resident with asthma is an opportunity to address and update on asthma prevention and management strategies. Primary care clinicians treating residential patients were positioned to have an influence in minimizing poor future health outcomes for this fragile population (Chaisson & Shore, 2014; NACP, 2013).

### **Framework for planning an implementation program**

The Precede-Proceed planning model served as an organizing framework for developing and improving the interventions in health programs aimed at specific disease reduction (Crosby & Noar, 2011; Green & Kreuter, 1991; Green & Kreuter, 2005; Soleiman Ekhtiari, Shojaeizadeh, Rahimi Froushani, Ghofranipour, & Ahmani, 2013). The model planning was structured to work backward in starting with the largest goal to produce the objectives to achieve the ultimate goal (Crosby & Noar, 2011; Soleiman Ekhtiari et al., 2013) of promoting optimal health care for the residential children with asthma. The largest goal of the program for the child with asthma and their legal custodian was to take ownership of managing their asthma by knowing their asthma action plan at discharge. The program's objectives were to (1) provide asthma education for the residents with current asthma, (2) to provide written individualized asthma management plans for the residents with current asthma, (3) to provide prescribed inhalers, and instructions on their use for the residents with current asthma, and (4) to provide peak flow demonstrations and monitor the recordings for the residents with current asthma, according to the EPR-3 guidelines. The ultimate goal for the residential children was to maintain control of their asthma by reducing their asthma symptom impairments (frequency and intensity of symptoms).

A holistic planning approach to health promotion was provided in the Precede-Proceed model to ensure that the important components were adequately addressed (Crosby & Noar, 2011; Soleiman Ekhtiari et al., 2013). There were two key aspects embodied in the intervention of this planning model: (a) planning, and (b) evaluation (Crosby & Noar, 2011). This model was adapted and applied in this project as a framework to provide a construct in assessing the factors associated with enabling the development of the program. The Precede-Proceed model provides a method for intervention development and a process for evaluating the program. The planning model structured a change in the clinical care to an evidence-based clinical practice appropriate for a pediatric residential primary care clinic. The EPR-3 guidelines (p.1, 2007) noted that the overall goal was to help the residents with asthma control their asthma so that they can be active all day and sleep well at night.

### **Social Assessment**

The following was a description of the project setting using assessment parameters informed by the Precede-Proceed planning model. Specific methods were presented in the section that follows. The facility was one of the largest pediatric therapeutic residential programs in the mid-west. The children ages ranged from 5 to 21 years of age. Approximately 95% of the children in the facility are in the custody of the Division of Family Services. There was a psychiatrist that provided individual sessions and medication management for the children. There were licensed clinical therapists at the facility that managed the psychiatric and behavioral aspects of the residents' care with individual and group therapy sessions. Most of the residents attended school in the local school district. The school on the campus provided a special education curriculum for the

residents that required more therapeutic support. The recreation therapy department provided activities year-round for the residents at the facility. The clinic provided primary and acute medical care for approximately 130 residential and foster care children who had been placed at the facility. The clinic was staffed with a pediatric nurse practitioner, a part-time family nurse practitioner, a registered nurse, a licensed practical nurse, a pharmacy technician, and a medical assistant.

There were an increased number of residents admitted to the facility with undiagnosed or poorly managed asthma. The children on the campus and in the foster homes with asthma were noted to have poor asthma symptom perception and a decrease in activity levels. Children in foster care generally have a higher prevalence of health care problems and often multiple home transitions as noted by the AAP (2014). In the project, an asthma treatment program was implemented in a residential primary care clinic at this facility.

The stakeholders listed in this category gave the project direction with their perspective, values, and experience. The facility administrator, the nurse practitioners, the registered nurse, the licensed practical nurse, the clinic staff, the clinical therapists and custodial parent or caseworker invested in the improvement in the standards of primary clinical health services for the residents with asthma. The facility administrator has determined that the residents benefited from the implementing of the national asthma guidelines in the clinic.

### **Methodology**

Data were collected and reviewed from the charts of the residents with the diagnosis of asthma. An essential clinical baseline for the evaluation of asthma care,

provided by the clinic was established for the measurement of outcomes. The documentation obtained from the charts included the number of residents that had received: 1) asthma education, 2) asthma action plans, 3) instructions on metered dose inhaler (MDI) technique, and 4) peak flow demonstrations and recordings, according to the NAEPP guidelines.

The nurse practitioners obtained the detailed history, provided the examination, classified the severity of the resident's asthma using the NAEPP guidelines, and determined whether a referral to a pediatric specialist was appropriate to rule out other conditions. The registered nurse and the licensed practical nurse assisted with the asthma education, MDI technique demonstrations, and peak flow meter follow-ups. The clinical staff attached asthma action plans to the charts of the residents that had a diagnosis of asthma. The residential workers were the caregivers that work in the cottages with the children. The residential workers knew the children's behaviors very well and were trained to assist with asthma management in the cottages where the residents with asthma live.

Children with asthma who live in foster care or residential placements are at high-risk for asthma complications. It is essential that residential facilities exert best practice in assessing and managing asthma care for these children. This quality improvement project helped children by establishing the implementation of a systematic process that influenced practice change.

### **Method**

- Design: The project was a single-group pretest-posttest design. Medical records were examined prior and post EPR-3 asthma educational intervention.



- **Setting:** The project was conducted at a primary care clinic located on the campus at one of the largest pediatric therapeutic residential treatment programs in a suburban Midwestern area of United States of America.
- **Sample:** Participants were male and female residents, 12-17 years of age, admitted to the clinic with a diagnosis of asthma, or any resident having experienced any asthma symptoms in the past year, consistent with the definition according to the EPR-3 guidelines. Twenty-nine children's records were studied.
- **Approval Processes:** This project was deemed exempt by the University of Missouri-St. Louis, Office of Research Assurance, Protocol [1023718-2].
- **Intervention:** An educational intervention consisting of: (1) basic lung anatomy and physiology to define asthma, (2) implementation of asthma action plans, (3) teaching MDI techniques, and (4) peak flow demonstrations and recording, was implemented.
- **Measures:** Records were reviewed prior to and 1-month post asthma educational intervention to determine chart documentation of (1) what is asthma, (2) asthma action plan, (3) MDI technique, and (4) peak flow demonstration and recordings.
- **Procedures:** Comparison of records reviewed pre-and 1-month post-intervention resulted in a significant increase in documented (1) asthma education, (2) asthma action plans, (3) MDI technique, and (4) peak flow demonstrations and recorded peak flow readings.
  1. The nurse practitioner reviewed and collected data from the charts:
    - a) Residents with a diagnosis of asthma age 12 to 17 y/o were included.

- b) The review sought documentation that the child knew what asthma was, had an asthma action plan (see Attachment A), demonstrated MDI technique, and peak flow demonstrations and peak flow numbers were recorded (see Attachment B).
2. The staff was taught the importance of implementing the National Asthma Guidelines and documenting in the resident's records.
    - a) The staff was provided education on (1) what is asthma? (2) asthma action plans, (3) MDI demonstration, and (4) peak flow demonstrations and peak flow recordings.
    - b) Correct process for documenting according to the NAEPP guidelines was discussed.
    - c) Clinical staff received education on written clinical policy for residents with asthma (see Attachment C).
  3. Clinic flow was revised post initial chart review and staff education.
    - a) New residents admitted to the facility with a diagnosis of asthma or, an established resident with a diagnosis of asthma having a follow-up visit in the clinic were identified.
      - (1) A Medical Assistant (MA) inserted an asthma action plan into the clear out-pocket on the front of the chart.
      - (2) Residential patients were directed to an examination room by the MA. The MA obtained the height, weight, and blood pressure.

- (3) The nurse practitioner reviewed the medications, symptoms, performed the clinical assessment, classified the residential patient according to NAEPP guidelines.
  - (4) The asthma action plan, initial asthma education, and MDI technique were completed by the nurse practitioner.
  - (5) The chart and the asthma action plan were given to the registered nurse (RN) or licensed practical nurse (LPN) to fax the asthma action plan to the child's school nurse.
  - (6) An RN or LPN scheduled follow-ups with the residential patients to review the asthma action plans, MDI techniques, and peak flows repeated in for 4-7 days.
  - (7) An RN or LPN reviewed the asthma action plans, peak flows, and metered dose inhaler techniques every 1-2 weeks with the residential patient.
4. Data were reviewed and collected from the charts of the resident's ages 12 to 17 y/o with the diagnosis of asthma, four weeks' post asthma education intervention with clinic staff. Data sought in records included:
- a) The child knew what asthma was.
  - b) Completed asthma action plans were present in the charts.
  - c) MDI demonstrations were documented.
  - d) Peak flows were demonstrated, and peak flow numbers were recorded.

- **Data Collection:** Records were identified from the pharmacy medication profiles that included albuterol as a prescribed medication by the residential facility. The residents' medical record numbers were used to generate a list of charts reviewed.

### **Data Analysis**

The data were analyzed using SPSS statistical software. Descriptive statistics were used to describe frequency and proportions of the pre-and post-sample chart reviews. The t-test (paired) was used to examine statistical differences between the pre- and post-intervention data. A *p*-value of  $<.05$  was considered statistically significant.

### **Project Timeline**

Pre-intervention data collection was initiated on 3/16/2017 after obtaining approval exempt status from the University of Missouri-St. Louis IRB on 3/15/2017. Staff received education sessions to reinforce the process of implementing the National Asthma Guidelines and the process of documenting. Post-intervention record review data collection was completed on 4/17/2017. The data collection for both the pre- and the post-record review was four weeks.

### **Outcomes**

The main outcome of this project was to increase the standards for best practice in providing care for an at-risk population of children with asthma residing at a residential facility. A secondary goal was to increase the staff's role in providing follow-up care and improving the documenting of asthma care in the clinic. It was anticipated that sample attrition, clinic staffing issues, and resident availability would be a challenge. Of the 32 records listed for review, three residents with asthma were discharged from the

residential facility after the start of the chart review, leaving 29 records for analysis. A sample size  $>30$  had been targeted to represent the population (Salkind, 2011, p. 143).

## Results

### Record Review

The clinic records were reviewed to determine the influence of staff education on the implementation of the national asthma guidelines in a residential pediatric clinic. Data were collected from 29 ( $n=29$ ) residential records. The frequency and proportion of the documented asthma guidelines reviewed in the records are presented in Table 1. The initial chart review (pre-intervention) indicated that the asthma action plan was the most frequently documented asthma guideline in the records (55%). Asthma education given to the residents was documented in 31% of the records. Peak flow demonstration and peak flow recording were documented in 17% of the records. The pre-chart review in Table 1, indicated that MDI technique demonstration, was the least documented (14%). Post-intervention, the MDI technique documentation is displayed in Table 1, as demonstrating the most significant clinical improvement (62%).

Paired  $t$ -test analysis, in Table 2, were used to compare the significant differences between the post-and the pre-intervention record reviews. Asthma education documentation was shown to be statistically significant post-intervention ( $M=.86$ ,  $SD=.35$ ) and prior to the intervention period ( $M=.31$ ,  $SD=.47$ ),  $t(28) = 5.87$ ,  $p < 0.05$ . A large effect size ( $ES=1.2$ ) was noted (Salkind, 2011, p. 198). Asthma action plans completed by staff post-intervention ( $M=.86$ ,  $SD=.35$ ) had significant improvement over the pre-intervention review ( $M=.55$ ,  $SD=.51$ ),  $t(28)=3.55$ ,  $p<0.05$ , with a large effect size ( $ES=.6$ ). MDI documentation demonstration post-intervention ( $M=.76$ ,  $SD=.44$ ) was

significant in comparison to the pre-intervention ( $M=.14$ ,  $SD=.35$ ),  $t(28)=6.77$ ,  $p<.05$ . Peak flow demonstration and peak flow recording documented had shown significant improvements post-intervention ( $M=.72$ ,  $SD=.46$ ) when compared to pre-intervention ( $M=.17$ ,  $SD=.38$ ),  $t(28)=5.87$ ,  $p<0.05$ , with a large effect size ( $ES=1.2$ ). The composite review of documented asthma guidelines (Table 2), were significantly higher post-intervention ( $M=3.93$ ,  $SD=1.81$ ) than pre-intervention ( $M=1.34$ ,  $SD=1.54$ ),  $t(28) = 7.99$ ,  $p<0.05$  for all measured variables. A large effect size is noted ( $ES=1.43$ )

### **Discussion**

The results of this analysis suggest that the quality improvement project was effective in increasing the number of children receiving asthma education, asthma action plans, metered dose inhaler demonstrations, and peak flow monitoring (and recordings). The nursing staff and the residents with asthma developed a stronger interest in asthma management. The nurses' set-up their individual schedules for asthma follow-ups to better address the needs of the residents. The residents with asthma looked forward to coming to see the nursing staff, to demonstrate their improved skills with the MDI and peak flow meter techniques. A sense of empowerment was demonstrated when the residents with asthma could state in their words (1) what asthma was, (2) which medication was a quick relief and how long it would last, and (3) which symptoms indicated that they were in their danger zone, and when to seek help. Clinic-based organizational changes, such as implementing national asthma guidelines and a clinical asthma policy, led to statistically significant improvements in asthma care for a high-risk population.

### **Limitations**

A limitation of the study was the small sample size. A sample size greater than 30 would approximate the general population. A second limitation was the clinic not having an electronic health record system for clinical support. An electronic health record systems would facilitate improved efficiency within the clinic with communication, documentation, and give reminders (regarding the asthma action plan, asthma education, MDI, and Peak flow technique) with each follow-up visit. The residents having unanticipated court dates and residential discharges from the facility presented a barrier to participation. Finally, the clinic was not able to fill a full-time nursing position due to limited funding by the facility. An additional nurse would have decreased the nursing work-load and improved the asthma follow-up care.

### **Implications**

#### **Practice**

This project was chosen by the author because of the increased number of residents admitted to the facility with poorly managed asthma. The children in foster care are a unique population having an asthma prevalence of 17% (Deutsch & Fortin, 2015; Maher et al., 2015). The project demonstrated that implementing evidence-based clinical practice and policy into a pediatric residential clinic improved the practice behavior of the clinical staff and the quality of care given to the residents with asthma. The tools that were provided (asthma in-services, asthma action plans, peak flow meters, and an evidence-based asthma policy) enabled the clinic staff to function more efficiently when providing asthma care. The post-record reviews indicated that the staff documented a 55% improvement in asthma education provided to the residents with asthma, a 55% improvement in asthma action plans completed and discussed with the residents with

asthma, a 62% improvement with meter dose inhaler demonstrations with the residents with asthma, and a 55% improvement in peak flow demonstrations and recordings with the residents with asthma. Implementing evidence-based guidelines and policy have encouraged best-practice for a high-risk pediatric population. Follow-up care is essential for this transient population.

### **Policy**

Szilagyi et al. (2015) emphasized that most states have not made substantial progress with coordinating the health care of children in foster care, although routine office visits for asthma are highly recommended and are paramount for effective asthma management and control (NAEPP, 2007). Patients reported that greater access to primary care is associated with lower mortality as reported by Jerant, Fenton, and Franks (2012). However, the shortage of primary care providers continues in the United States, especially in urban and rural areas (Van Vleet & Paradise,2015). Primary care nurse practitioners (NPs) are more likely than primary care physicians to practice in urban and rural areas (Buerhaus, DesRoches, Dittus, & Donelan, 2015). Hain and Fleck (2014) emphasized that nurse practitioners assume various roles that include caring for ethnically diverse, underserved populations within an aging society and across many healthcare settings.

The National Governors Association (NGA, 2012) reported that research suggests that NPs can perform many primary care services as well as physicians do and achieve equal or higher patient satisfaction rates among their patients. However, state legislative and regulatory barriers prevent NPs in many states from practicing to their full potential (Van Vleet & Paradise, 2015). Van Vleet and Paradise (2015) stress that NP practice is



regulated largely by the states through licensure laws and policy on “scope of practice” and prescriptive authority. These laws make it necessary to involve another provider resulting in a delay in patient care and additional cost to the federal budget, according to the American Association of Nurse Practitioners (AANP, 2015).

In my view, now is the opportune time for advanced practicing nurses to work with local, state, federal legislators, or run for a political office, to promote changes in outdated policies that inhibit advanced nursing from practicing at their full scope of practice. There is a strong need to support organizations such as the American Association of Nurse Practitioners and local nursing chapters to promote the changes in policies that are needed to enable nurses to care for the under-served populations in the rural and urban areas.

### **Education**

The Institute of Medicine ([IOM], 2011) reported that the healthcare system in the U.S. is transitioning into the 21<sup>st</sup>-century and that there is now a narrowed window in which the APN must transition. The IOM (2011) further emphasized that 20<sup>th</sup>-century nursing education can no longer accommodate the needs of the practice demands, with the complexity of the 21<sup>st</sup>-century healthcare delivery system. The American Association of College of Nursing (AACN, 2006) and the IOM (2011) strongly encouraged transformational changes in advanced nursing education to a doctoral level to meet the needs of the populations (such as the high-risk pediatric population). Recommendations were adopted from the AACN (2004, p.4) position statement that the DNP degree has been adopted as the terminal practice degree in nursing. Chism (2013, p.22) stressed that the DNP degree builds upon formulation, interpretation, and utilization of evidence-based

practices, health policy, information technology, and leadership. In my view, the DNP degree is the terminal stepping stone in education, to adequately prepare the APN for transitioning into the 21st century healthcare delivery system.

### **Conclusion**

This quality improvement project was successful in demonstrating that staff education on the importance of utilizing the national guidelines for asthma education does influence the implementation of such guidelines in a residential pediatric clinic. The improvement standards for best practice are noted in the clinical-organizational changes, and the sense of empowerment demonstrated by this transient pediatric population is evident, taking the step toward sustaining self-management of their asthma care.

### **Recommendations for future research**

The literature review demonstrated that there was a lack of data regarding pediatric primary care clinics in a residential facility. This project helped in filling the literature gap on a high-risk pediatric population with asthma in a foster care setting. Larger studies are needed to further examine the course of pediatric asthma for children in foster care.

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**Table 1.****Documentation Frequencies (n=29)**

	<u>Post-intervention: (%)</u>	<u>Pre-intervention: (%)</u>	<u>Difference: %</u>
Asthma Education	86% (25)	31% (9)	55% (16)
Asthma Action Plan	86% (25)	55% (16)	55% (16)
MDI Demonstration	76% (22)	14% (4)	62% (18)
Peak Flow Demonstration and Recording	72% (21)	17% (5)	55% (16)

*Note.* In parentheses are the number of records that included the indicated variable.

**Table 2.****Paired T-Test Results (n=29)**

	<u>Post-test</u>		<u>Pre-test</u>		<u>t</u>	<u>95% CL</u>		<u>ES</u>
	Mean	(SD)	Mean	(SD)		LL	UL	
Asthma Education	.86	(.35)	.31	(.47)	5.9	(.36,.74)	1.2	
Asthma Action Plan	.86	(.35)	.55	(.51)	3.6	(.13,.49)	0.6	
MDI Demonstration Peak Flow	.76	(.44)	.14	(.35)	6.77	(.43,.81)	1.4	
Demonstration and Recording	.72	(.46)	.17	(.38)	5.9	(.36,.74)	1.2	
Composite Review	3.93	(1.81)	1.34	(1.54)	7.99	(1.9,3.3)	1.4	

*Note.* *SD*=standard deviation; *t*=obtained value; *CL*=confidence interval; *ES*=effect size.

Critical value=1.701 (Salkind, 2011, p.354). A *p*-value of <.05 was considered statistically significant.

## Appendix A

### Asthma Action Plan

#### Asthma Action Plan

For: \_\_\_\_\_ Doctor: \_\_\_\_\_ Date: \_\_\_\_\_  
 Doctor's Phone Number: \_\_\_\_\_ Hospital/Emergency Department Phone Number: \_\_\_\_\_

GREEN ZONE	Doing Well	Take these long-term control medicines each day (include an anti-inflammatory).		
	<ul style="list-style-type: none"> <li>No cough, wheeze, chest tightness, or shortness of breath during the day or night</li> <li>Can do usual activities</li> </ul> <p>And, if a peak flow meter is used,</p> <p>Peak flow: more than _____ (80 percent or more of my best peak flow)</p> <p>My best peak flow is: _____</p> <p>Before exercise <input type="checkbox"/> _____ <input type="checkbox"/> 2 or <input type="checkbox"/> 4 puffs _____ 5 minutes before exercise</p>	Medicine	How much to take	When to take it
		_____	_____	_____
		_____	_____	_____

YELLOW ZONE	Asthma Is Getting Worse	First	Add: quick-relief medicine—and keep taking your GREEN ZONE medicine.
		<ul style="list-style-type: none"> <li>Cough, wheeze, chest tightness, or shortness of breath, or</li> <li>Waking at night due to asthma, or</li> <li>Can do some, but not all, usual activities</li> </ul> <p>-Or-</p> <p>Peak flow: _____ to _____ (50 to 79 percent of my best peak flow)</p>	<input type="checkbox"/> _____ (short-acting beta <sub>2</sub> -agonist) <input type="checkbox"/> 2 or <input type="checkbox"/> 4 puffs, every 20 minutes for up to 1 hour <input type="checkbox"/> Nebulizer, once
		If your symptoms (and peak flow, if used) return to GREEN ZONE after 1 hour of above treatment: <input type="checkbox"/> Continue monitoring to be sure you stay in the green zone.	-Or- If your symptoms (and peak flow, if used) do not return to GREEN ZONE after 1 hour of above treatment: <input type="checkbox"/> Take: _____ (short-acting beta <sub>2</sub> -agonist) <input type="checkbox"/> 2 or <input type="checkbox"/> 4 puffs or <input type="checkbox"/> Nebulizer

RED ZONE	Medical Alert!	Take this medicine:
	<ul style="list-style-type: none"> <li>Very short of breath, or</li> <li>Quick-relief medicines have not helped, or</li> <li>Cannot do usual activities, or</li> <li>Symptoms are same or get worse after 24 hours in Yellow Zone</li> </ul> <p>-Or-</p> <p>Peak flow: less than _____ (50 percent of my best peak flow)</p>	<input type="checkbox"/> _____ (short-acting beta <sub>2</sub> -agonist) <input type="checkbox"/> 4 or <input type="checkbox"/> 6 puffs or <input type="checkbox"/> Nebulizer <input type="checkbox"/> _____ mg (oral steroid)
	Then call your doctor NOW. Go to the hospital or call an ambulance if: <ul style="list-style-type: none"> <li>You are still in the red zone after 15 minutes AND</li> <li>You have not reached your doctor.</li> </ul>	

**DANGER SIGNS** ■ Trouble walking and talking due to shortness of breath ■ Take  4 or  6 puffs of your quick-relief medicine AND  
 ■ Lips or fingernails are blue ■ Go to the hospital or call for an ambulance \_\_\_\_\_ NOW!  
 (phone)

Note. Obtained October 13, 2017 from

[http://www.nhlbi.nih.gov/files/docs/public/lung/asthma\\_actplan.pdf](http://www.nhlbi.nih.gov/files/docs/public/lung/asthma_actplan.pdf)

## Appendix B

### Peak Flow Diary

		WEEK 1							WEEK 2						
Day of the week		M	T	W	T	F	S	S	M	T	W	T	F	S	S
Warning symptoms	Used reliever inhaler														
	Had asthma symptoms such as shortness of breath, tight chest, coughing or wheezing														
	Waking at night with asthma symptoms														
	Feeling like you can't keep up with your normal day-to-day activities														
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
800															
780															
760															
740															
720															
700															
680															
660															
640															
620															
600															
580															
560															
540															
520															
500															
480															
460															
440															
420															
400															
380															
360															
340															
320															
300															
280															
260															
240															
220															
200															
180															
160															
140															
120															
Weekly comments: anything unusual this week that might have resulted in a lower score? eg. 'I was stressed', I exercised, I came into contact with a pet.															

Feel free to photocopy empty pages to add them to your diary or download more from our resources section at [www.asthma.org.uk/advice/resources](http://www.asthma.org.uk/advice/resources)

Note. Adapted from Asthma UK: Health advice. Retrieved October 13, 2016 from [www.asthma.org.uk/advice/resource](http://www.asthma.org.uk/advice/resource)

## Appendix C

### Clinic Policy/Procedure

SUBJECT: TREATMENT OF RESIDENTS WITH ASTHMA
EFFECTIVE DATE:
DISTRIBUTION:

#### PURPOSE:

To provide a clinical protocol for the medical treatment of foster care and residential children with asthma. The protocol provides best practice for the clinic's unique asthma population.

#### POLICY:

To provide evidence-based clinical practice when providing medical care for foster care and residential children with asthma. Asthma education, asthma action plans, metered dose inhaler techniques, and peak flow demonstrations will be provided for all patients with asthma.

#### PROCEDURE:

- On admission, the nurse practitioner will obtain a detail history, provide a detailed examination, classify the severity, and determine whether a referral to a pediatric specialist is appropriate.
- The nurse practitioner will initiate the asthma education and write an individualized asthma action plan.
- The registered and licensed practical nurse will assist with the asthma education and peak flow follow-ups.

The pharmacy technicians/medical assistants will attach asthma action plans to the charts of the residents that have a diagnosis of asthma.

*Note.* Policy is consistent with National Guidelines, Expert Panel Report-3 (EPR-3, 2007)