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Improving provider compliance of the NAEPP 2007 asthma guidelines through the

electronic health record (EHR) in a pediatric primary care practice

Tiffany L. Kidd

A research project submitted to the Graduate Faculty of

JAMES MADISON UNIVERSITY

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FACULTY COMMITTEE:

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Dr. Andrea Knopp

Dr. Loan Kline

Dedication

This scholarly project is dedicated to all individuals with asthma, to those still struggling with control, to those whose asthma is well-controlled. Also to my family who have been such great supporters and cheerleaders though this process.

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I would like to thank the following for all their encouragement, patience, listening ears, and reassurance. I am deeply grateful for the guidance and support that I received from the nursing faculty at James Madison University. A special gratitude to my project chair Dr. Sharon Strang Zook for her wisdom, the many hours she spent reviewing my work and providing me with feedback. I also want to thank Dr. Andrea Knopp for her encouraging e-mails and believing in me and being part of my project committee. I am deeply thankful for my preceptor, colleague, and friend Dr. Loan Kline in her assistance during the project and believing in the project's mission and vision and her constant mentorship. To the staff at Richeson Drive Pediatrics words cannot express my gratitude to you for your patience with me as I implemented this project and beyond. You are all so very much appreciated. To all my colleagues, boss, and friends thank you for bearing with me during this last year of understanding when I had to say no to schedule needs, events, and other projects. I would also like to acknowledge my family and friends, without whose encouragement and support, I would have given up time and time again. Thank you for your listening ears, your advice, your prayers, and just for being there for me. Finally, I am grateful for my family in their giving up of their time to my schoolwork and my completion of this degree. This wouldn't have been possible without your understanding, and selflessness. Thank you GOD for giving me the patience, strength, and health to get through this program. As far as the *magnificent* first seven, we are the first James Madison University Doctoral of Nursing Practice graduates!

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Abstract

The Expert Panel Report -3 (EPR3) NAEPP 2007 evidence-based clinical asthma guidelines were developed to provide evidence-based high-quality patient care that leads to improved outcomes. A literature review showed that healthcare providers do not routinely follow the asthma guidelines. The purpose of this project was to develop and implement an evidence-based asthma electronic health record (EHR) template in a pediatric office to improve provider compliance to the guidelines resulting in improved outcomes for children with asthma. The study was conducted over a period of four months from January - April 2016. An EHR asthma protocol template and training for providers using a PACE program (physician asthma care education) on current guidelines was provided. A retrospective EHR audit measuring provider's compliance was performed. Pre/post aggregate data for documentation specific to asthma was collected and analyzed using the chi square method. The outcome objectives from this quality improvement study focused on provider compliance and asthma control. Results indicated the EHR template significantly improved provider documentation in compliance with 7 of the 8 areas measured.

Keywords: pediatric asthma, provider compliance, asthma guidelines, EHR tool

Introduction and Background

While national organizations urge use of standards of care in health care practice, providers may have trouble determining the current state of evidence. There is a gap between the generation of knowledge and its translation into practice. The Institute of Medicine (IOM) (IOM, 2007) recommends that decisions affecting health care should be grounded in a trustworthy evidence base practice recognizing poor dissemination of the evidence impacts provider compliance. 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 meet the needs of individuals, standards are necessary for safe, reliable quality care.

Practicing high-quality medical care requires incorporating existing guidelines into routine care. The implementation of practice guidelines is often a slow process taking five years or more to move from consensus and publication to practice implementation (Boaz, Baeza, & Fraser, 2011). Even when guidelines are broadly accepted they are often not followed (Bell et al., 2010). To improve adherence, researchers have studied many interventions including clinician education, quality-improvement programs, and incentives (Okelo, 2013; Akinbami, 2009). Information systems that provide support to users at the time they make decisions may enable health clinicians to accelerate adoption of guidelines and eventually close the gap between optimal and actual practice (Bell et al., 2010).

Using the EHR as a platform for guidelines provides a design that adheres to the concepts that are most important for decision support to be effective. Examples of this

are automatic prompting, delivery speed (ex. during the patient visit), smooth integration into the clinicians' work flow, and trust for recommendation accuracy individualization (Boulet, 2012; Medves, 2009; Weinstein, 2011). With attention to the concepts above, clinical decision support (CDS) are successful in improving practitioner performance in adherence to disease-management guidelines and improving overall health outcomes (Boulet, 2012; Medves, 2009; Okelo, 2013; Weinstein, 2011).

Problem Statement

Pediatric asthma is a significant public health problem. Asthma is the third leading cause of pediatric hospitalizations, costing $20 billion in 2014. In the United States, approximately 6 million children (younger than 18 years of age) have asthma, with rates disproportionately affecting low-income and minority population. (Centers for Disease Control and Prevention [CDC], 2014). Asthma is not preventable, but solutions exist to decrease exacerbations, emergency department visits, and hospitalizations. Despite evidence based pediatric guidelines, implementation is lagging with only 35 % of providers using guidelines (Shapiro et al, 2011). With lack of compliance to guideline recommendations, attention has focused on why best practices are not followed by health care providers. The question asked in this study is "Does provider compliance of the NAEPP 2007 asthma guidelines improve through an electronic health record (EHR) template in a pediatric primary care practice?

Objectives and Aims

The purpose of this project was to determine if implementation of a pediatric asthma electronic health record template: (1) increases provider compliance with recommended NAEPP 2007 asthma guidelines and (2) Improves pediatric patient's asthma control. The

plan targets electronic health records of asthma patients' ages 5-12 years and triggers appropriate therapy by primary care providers at Richeson Drive Pediatrics.

The aim of this project was to increase providers' compliance to NAEPP 2007 asthma guidelines use and recommendations through an EHR template. Expected project outcomes are:

1. Increased documentation of asthma education

2. Increased documentation of use of asthma action plans

3. Increased documentation of pharmacology adherence

4. Increased documentation of asthma severity/control measures, and increased prescribed controlled medications for patients with persistent asthma.

By increasing provider compliance in use of the EHR template it is anticipated that pediatric patients' asthma control will improve the following outcomes:

1. Decreased patients' number of hospitalization visits (inpatient and/ or emergency room)

2. Decreased patients' number of outpatient visits

3. Decreased patients' number of missed school days

4. Increased patients' follow up appointment adherence

Review of Literature

A systematic review of the current literature evaluating provider compliance in the pediatric asthma NAEEP 2007 guidelines serves as the background of evidence for this study. Guidelines help health care providers in providing the most current and accepted standards of practice for patients with asthma. However, compliance is often difficult for health care providers as well as patients with asthma. Adherence to the 17 NAEEP asthma care quality indicators is only 45.5% (Mangione-Smith, 2007). The NHLBI Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma is a large 440-page evidence based document covering all aspects of pediatric and adult asthma identification, diagnosis, treatment and management (NAEPP, 2007).

Due to the high prevalence of asthma, inconsistencies in standards of care, burden of asthma, and other socioeconomic factors, the Institute of Medicine (IOM, 2011) designated quality improvement in asthma as a priority. By recognizing the inconsistencies and need for improvement in managing asthma, the National Heart, Blood and Lung Institute's National Asthma Education and Prevention Program (NAEPP, 2007) was developed as a national guideline for the diagnosis, treatment and management of asthma. These guidelines are endorsed by the American Academy of Pediatrics. The clinical practice guidelines for the management of pediatric asthma were developed through research and evidence based findings from high-quality randomized controlled trials and meta-analyses (NAEPP, 2007).

Due to the length of the clinical practice guidelines, a more concise version highlighting key core elements is needed. The use of the EHR at most institutions,

incorporating guidelines into work flow practices are imperative to provide high quality of care. Research highlights a need for additional research in the area of EHR target decision making to influence provider's adherence with guidelines for asthma. Further study is needed to determine whether the use of decision-making tools, incorporated into routine pediatric care, improves asthma outcomes (Shapiro et al., 2011).

Numerous articles reviewed had specific information regarding ways to implement clinical practice guidelines. Implementation techniques ranged from qualitative studies exploring healthcare provider's attitudes regarding guideline use and determining ease of use (Bhogal et al., 2010; Okelo et al.,2013; Salama, Mohammed, El Sayed, & Said,2010) to more straight forward suggestions such as educational training sessions, medical record revisions, guideline format, and provider prompting tools (Hartman & O'Connor 2009; O'Laughlen, et al, 2009). Unfortunately, no one technique was determined to be best for implementation of guidelines.

In a RCT study conducted by Cloutier, Tennen, Wakefield, Brazil, and Hall (2012), the study intervention to increase asthma guideline adherence focused on the primary care provider. Some of the reasons proposed by providers for not adhering to asthma guidelines were lack of awareness, knowledge, and time constraints. The study demonstrated a correlation between providers' increased utilization of asthma guidelines and implementation of a specific asthma program for their patients. Providers who received education on the asthma guidelines were more confident in implementing the guidelines.

Other areas in asthma care that lack provider adherence included providing asthma action plans, teaching proper inhaler technique, and long-term medication

interventions such as environmental trigger control. Evidence has shown, only 21% of providers in the United States utilize asthma action plans (AAPs) (Gillette et al, 2013). The use of AAP increased from 10% to 74% through incorporating the AAP in the EHR during Gillette's study (2013). According to the CDC (2013), 48.6% of children were more likely to report having been given an AAP compared with 27.4% of adults. Less than 50% compliance is unacceptable according to CDC standards.

Clinicians are expected to practice evidence-based medicine, but they must be given the tools necessary to adhere guidelines. Research shows that when guidelines are followed, there can be a significant improvement in the quality of life for asthmatic patients. (Gilbert et al., 2011; Yeats et al, 2010). Programs that have simple guidelines, offer decision support tools, and use electronic technology may improve quality of care for asthma and increase provider adherence to guidelines (Cloutier, 2016). It is crucial to identify the reasons providers are not following guidelines and use this information to create or find an intervention to improve provider adherence. With insufficient evidence in the literature supporting effectiveness of EHR templates to increase provider compliance in guideline use, this Doctorate of Nursing Practice (DNP) study investigated the use of an electronic template by providers and evaluated the impact on compliance and asthma control in pediatric patients.

Theoretical Model

This DNP project was guided by translation theory by Greenhalgh, Robert, MacFarlane, Bate and Kyriakidou (2004). Translation theory provides a conceptual framework applying research findings to practice within an organization as part of a quality improvement (QI) project. The pediatric asthma project used Greenhalgh's

theory within the practice setting by promoting consistent use of the EHR template and translating evidence into practice by providers for continuity care of all asthma patients.

According to Greenhalgh et al. (2004), effective translation of evidence into practice is dependent upon the following key determinants: diffusion, dissemination, implementation, and sustainability. Figure 1 shows a diagram of the theoretical model. Diffusion is a passive process of knowledge sharing. This project began with a discussion amongst providers within a practice group about asthma care. A query about the use of evidence based guidelines, current processes in the office for asthma patients, and goals for the practice related to quality metrics and improving outcomes was investigated.

Dissemination is an active process that includes planning and has goals directed to targeted groups in adopting the intervention. Active dissemination is more beneficial when implementing new strategies, such as the use of an EHR template. This project was designed utilizing the discussion findings and creating an EHR template that could assist in guiding the goal directed requests from the group to improve care for asthma patients.

Successful implementation includes active planning efforts to embrace the innovation system wide. The implementation occurred with key leaders embracing the idea for change and wanting improvement in current practice that wasn't effective in providing consistent care to patients amongst the providers. From an initial brainstorming discussion among providers and staff, requests for improved EHR template components, spirometry training, review of current guidelines recommendations, and a standard asthma education program for patients was created to implement the DNP

project. The project was implemented with providers, reception staff and nursing staff in the practice.

Sustainability is achieved when the innovation becomes a routine process within the organization. This EHR template became a routine part of the charting. All providers want to continue use of the EHR template, allowing asthma patients to continue receiving the program's education materials despite data collection ending. Greenhalgh's conceptual model emphasizes the measurement of short and long-term patient goals, methods, and system outcomes to evaluate intervention success with widespread use. The outcomes measured in this project were short term with anticipation that the results would lead to long term outcomes. System outcomes were incorporated with the conclusion of the project to be evaluated quarterly. To be effective in the translation innovation for the completion and use of the EHR template, an excel spreadsheet was used to help plan, develop, implement and disseminate the project's results.

Project and Study Design

Prior to this project, continuity was lacking in the practice among providers with variation in asthma education to patients. There was no standard set of tools (handouts, videos and action plans) used for education and spirometry was not available. Spirometry wasn't available. There was minimal training on interpretation of spirometry results, no symptom control score tool used, and variation in asthma coding prior to ICD 10 implementation in October 2015. An existing asthma template in the EHR did not contain key components recommended by NAEPP to assess risk impairment and control.

The project was a quality improvement (QI) project implementing an EHR template for pediatric asthma visits and provider education to support the compliance of

following the NAEEP 2007 asthma guidelines. A retrospective EHR chart review of 50
randomly selected patients with the same ICD-9/10 code as the post implementation
group (493.00–493.92- asthma), within the same seasonal time frame, ages 5-12yrs was
done to determine documentation pre-and post-project implementation. Data reviewed
was: documentation of asthma action plan, asthma severity category, adherence to a PCP
follow-up appointment prescribing of symptom prevention medication, ED visits and
hospitalizations, C-ACT score, spirometry use, asthma education, and missed school
days.

The intervention for education to providers was a simultaneous in-service training
with review of existing 2007 guidelines, spirometry training, universal use of standard
approved office handouts and education videos, use of a symptom control tool, and one
consistent asthma action plan. A spirometry machine was purchased by the office as that
was a user friendly machine for the staff.

Setting and Resources

The setting for this study was a pediatric practice located in Lynchburg, Virginia.
The practice is an independent office that is staffed with 4 pediatricians and 1 pediatric
nurse practitioner. The practice serves patients from newborn to 21 years of age. The
average number of asthma patients treated by each provider is approximately 600.
Permission from the site was obtained (*Appendix A)*.

Study Population

Participants were four pediatricians from Richeson Drive Pediatrics. Medical records

from asthma patients seen by the nurse practitioner (project investigator) were excluded

from the data collection to reduce bias. All four pediatricians consented to the study

Sources of Data

An electronic health record template for the primary care office to use with pediatric

asthma patients was developed. By incorporating the NIH NAEEP 2007 asthma

guidelines, the template prompted the providers to follow the current recommendations

for patient's asthma visits. It was a decision support aid to provide continuity and a

standard of care amongst providers following the recommended evidence based

guidelines.

A provider educational program using the PACE (physician asthma care education)

from NIH was conducted. PACE is a two-part interactive, multi-media educational

seminar to improve physician awareness, ability, and use of therapeutic communication

techniques for reducing the effects of asthma on children and their families during office

visits.

The medical record review tool was designed by the investigator. The primary

investigator was the only person accessing, collecting, and entering data on this tool. A

children's asthma control tool (C-ACT) was included in the EHR as a tool to evaluate

asthma symptom control. The C-ACT tool is designed from GlaxoSmithKline R&D and

permission for use was granted .This tool has a validated scoring tally based on patient

reported symptoms that determines asthma control. There are two C-ACT tools based on

age and cognitive ability. One tool is for ages 4-11yrs and the other is for ages 12yrs and

older. Since the study included children ages 5-12yrs, both tools were integrated in the

EHR template.

Data Analysis

The effectiveness of the educational intervention was measured through assessment

of the outcome variables and provider compliance in the use of a completed asthma EHR

template. The independent variable was the educational intervention given to the health

care providers and office staff on the use of the new template through an initial in-service

followed by face-to-face meetings, and samples of completed templates. The outcome, or

dependent variable, provider compliance was defined and measured through evaluation

of the presence of an appropriately completed EHR template on eligible medical records

during the study period. Patient asthma control outcomes were studied by the number of

hospitalizations, outpatient visits, missed school days and C-ACT score. The

retrospective chart review included patient outcomes available in the provider

documentation.

The medical record review tool was used for the pre- and post-evaluation design; the

outcomes were measured and analyzed. The data assessed was dichotomous categorical

variables of yes/no. An asthma template had all applicable data areas completed was

recorded as a yes. A partially or not completed template was recorded as a no.

Continuous variables of patient age (in years) and nominal dichotomous variables of

gender (male/female), asthma diagnosis and insurance type (Commercial, Medicaid,

Private pay), and yes or no to the presence of fully completed AAP, school nurse

involvement, and number of visits to ER or outpatient visits was recorded on the medical

record review tool for descriptive statistical reporting. A medical record review tool was used to check compliance data.

Pre-and post-data was compared for statistical significance. Statistical significance was defined as a P value < 0.05. The chi square was used for statistical analysis. The Chi square test was appropriate to analyze comparisons as the independent and the dependent variables were measured on a nominal or ordinal scale (Polit, 2010). The post implementation data was hypothesized to have a higher percentage in provider compliance than the previous scores for adherence to NAEPP 2007 asthma guidelines, thereby providing evidence supporting the effectiveness of the instructional intervention. Data was entered initially into an excel 2010 report sheet and then at project completion, into Statistical Package for the Social Sciences (SPSS) version 23.

Results

Fifty (50) charts pre-and post-implementation were audited. The average age of children in charts audited pre-implementation was 8.5 years and post implementation was 8.7 years, 66 % were male and 34 % were female pre-and post-70 % male and 30% female. Sixty-six percent were commercial payers, 30 % were Medicaid and 4 % self-pay pre-and post was 62 % commercial, 38% Medicaid with 0% self-pay *(Table 1).*

Asthma documentation components in the EHR template are displayed in *Table 2.* The table shows comparison of documented areas pre-and post-template design, and the statistical significance. Documentation of each asthma indicator increased significantly after implementation of EHR template and education to providers. Documentation of asthma action plan markedly increased from 10 % to 74 % $p = 0.001.$, spirometry use rose from 4% to 32 % $p = .011$, asthma education increased from 60 % to 98% $p=.000$,

follow up appointment adherence rose from 60% to 98% p = .000 and asthma severity categorized improved from 32% to 100 % p=. 011. Statistical significance was shown in 7 out of the 8 quality measurements. The area of prescribing controller medication for persistent asthma showed clinical significance with 58% to 100% improvement, but was not statistically significant (p=.258) because Clinical knowledge was present with the providers prior to the intervention on managing persistent asthma. Therefore, statistical significance was not noted. In addition, charts of the same patients were not used in comparison for this study.

These results supported the hypothesis that an EHR template with embedded evidence based guidelines improved provider documentation of an asthma action plan, asthma severity category, adherence to a PCP follow-up appointment, and prescribing of symptom prevention medication. ED visits, hospitalizations missed school days C-ACT score, spirometry use, and asthma education documentation improved.

Quality

A noted strength of this quality improvement project was the integration of evidenced based practice national guidelines and systematic reviews resulting in a change in provider practice. To enhance the reliability and validity of the review tool, categorical variables of yes/no were defined as "yes documentation is present and completed with all applicable data areas fully filled out on the chart or "no", it is not completed fully or not on the chart. This strict operational definition strengthened the validity in the determination of provider compliance change.

Benefits of this study include contributing to the evidence regarding best practices in pediatric asthma office care and improving patient care outcomes through

documentation that is led by evidence based guidelines embedded in an EHR template. Care is standardized within the practice amongst providers. Patients in a practice can be seen by any provider and still receive standard of care through an EHR template design used for individualized patient care. In addition to providing evidence based care, improving patient coordination, reducing errors, and improving patient safety, better outcomes occur more frequently. There is an increase in compliance with meaningful use guidelines for asthma which increases reimbursement funds to the practice. Increased cost capture in visits and proper coding reimbursement is maximized from the documentation in the EHR template.

Ethics and Human Subjects Protection

Institutional Review Board (IRB) approval from James Madison University was granted on September 14, 2015 with a project start date on January 2016 and ending on April 30, 2016.There were no major concerns related to ethical issues within the team. All ancillary staff and providers were motivated to change and supported the DNP project. To ensure patient confidentiality, the records for patients in this study were kept at the outpatient primary care office. The primary investigator was the only person with access. Data was abstracted from a retrospective medical record review and recoded by the primary investigator with a pseudo-identifier (no patient identifiers) and kept in secure files on a password protected computer. Any paper copy was locked in a file cabinet with the key secured. No research data was linked to individual patients.

Identity of the providers or staff was not collected or recorded. Data was stored in a locked filing cabinet separately from the study data, and the master list of provider participants and codes was securely stored separately from the rest of the data in another

locked file cabinet drawer. No more than minimal risks were expected from involvement in the study due to confidentiality of information. Upon completion of the study, all individual data was destroyed by a 3 way shredder by the primary investigator.

Timeframes or Timeline

The DNP QI project was conducted over a four-month period (16 weeks) starting in January 2016, excluding project planning and development. Office staff education was completed in December 2015 with educational boosts to staff (face-to-face, emails and/or sample templates) once per week for two weeks in January 2016.All data was gathered prior to the end of the April 2016. Data was compiled and analyzed September 2016 with dissemination of results in November 2016.

Budget

There was no cost for this study. A grant from a donor in memory of a local pediatrician- Dr. Peter Houck through James Madison University (JMU) of $1000.00 was awarded for use. Two I-pads were purchased with these grant funds for office asthma education videos and use of the C-ACT tool. Remaining funds were used to aid in dissemination of study results through poster and podium presentations.

Strengths and Weaknesses of the Study

A strength of this study was the dissemination process which was very effective. Strengths of this study were providers' willingness to change and evaluate current patient care and desiring improvement standards of care treatment for patients with asthma. Providers' enthusiasm and participation facilitated the effectiveness and success of the project. No cost to the office for participation in this project was another added strength. The spirometry machine was purchased by the office as they had recognized the need for

this testing prior to the project. This project reinforced the importance of a functioning and user friendly machine for staff to utilize and implement.

A weakness of this study was the structure of the EHR; this record may not represent the documentation utilized in other EHRs. Extrapolating data from an EHR is difficult; exact insight to the documentation may be misrepresented as there are many file folders in a patient record which contain data but may not be in the actual template provided. This can lead to missed linked data that was documented prior to the template implementation. Data requests are only as good as the requestor.

Another weakness involved length of visits. Documentation took more time affecting the overall schedule of patient visits. The template impacted provider time in documentation therefore lengthening the patient visit and impacting work flow and number of patients seen. Visit time may be shorter as providers and staff becomes more accustomed to the template. The spirometry equipment entailed new learning and interpretation training, equipment use, and calibration. Uploading this data to the EHR was challenging as there was no onsite company IT personnel. Technical issues that arose resulted in a phone call to a help desk resulting in longer patient visits. As the project moved forward, the challenges with spirometry use and technical issues decreased.

Conclusion

This project was aimed at increasing providers' compliance to NAEPP 2007 asthma guidelines use through an EHR template. Project findings successfully demonstrated the intervention of an EHR template increased provider documentation in all areas of review. By providing a template in the EHR to guide pediatric asthma visits, provider's compliance increased using current evidence based guidelines. This increase

in compliance can lead to improved outcomes for patients with better control, less missed school days, less outpatient visits, and less hospitalizations.

A limitation to this study was data for missed school days, hospitalization visits, and outpatient visits was not compared to pre-intervention data. This impacted the ability to validate the secondary purpose of this study to improve pediatric patients' asthma control. Time limitations curtailed collection of this information; however, there is the opportunity to continue building on this pilot project.

This project led to the adoption of the pediatric asthma EHR template in over 20 office groups within the community of Central Virginia quality Care Network (Archetype). This adoption will incentivize providers to provide current evidence based care by utilizing the template in office visits. This supports the value pay for performance concept. In addition, the documentation will be monitored for quality metrics in individual performance evaluations beginning in January 2017.

Future interventions include development of a follow up asthma visit template to reflect similar documentation components. Several recommendations emerged from this study. First, expansion of the EHR template use for ages 2-18years (this project was inclusive of age's 5-12 years). Secondly schedule longer appointment times (15 minutes to 30 minutes) to integrate template recommendations with education and spirometry. Thirdly, a benchmark goal for success is needed for individual and overall group practice documentation as there are currently no national benchmarks available for this specific metric. Providers who participated in this project chose a benchmark goal of 90 % for asthma documentation to achieve success and be monitored quarterly.

Future research on patient specific outcomes related to provider compliance related to number of missed school days, number of hospitalizations and number of emergency department visits would highlight improved asthma control. Comparison data from this pilot to study and future projects would show continued benefit of the interventions introduced in this project. In addition to improving patient asthma outcomes, a prospective study to determine if patients are managing and controlling their asthma well as a result of the use of standardized asthma education and action plan is warranted.

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Appendix A-site letter

RICHESON DRIVE Pediatrics

105 Richeson Drive, Lynchburg, Virginia 24501   434.385.7776   fax 434.385.5846

Site Coordinator Letter of Permission

DATE
4/1/2015

Institutional Review Board
James Madison University
MSC 5738
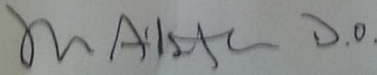601 University Boulevard
Harrisonburg, VA 22807

Dear Institutional Review Board,

I hereby agree to allow Tiffany L. Kidd, from James Madison University to conduct her research at Richeson Drive Pediatrics in Lynchburg ,Va. I understand that the purpose of the study is to determine if implementation of a pediatric asthma electronic medical record template: (1) increases provider's compliance with the NAEEP 2007 asthma guidelines and (2) if pediatric asthma is in better control. The plan will target pediatric asthma patients ages 5-12 years and will trigger appropriate therapy to be taken by primary care providers at Richeson Drive Pediatrics.

By signing this letter of permission, I am agreeing to the following:

JMU researcher(s) have permission to be on Richeson Drive Pediatrics premise.

JMU researcher(s) have access to the data collected to perform the data analysis both for presentation to Richeson Drive Pediatrics and/or for publication purposes.

Sincerely,

M Alstc D.O.

Name of Authorized Individual, Title
Richeson Drive Pediatrics

Table 1. Demographics of study participants

Demographics		Pre (n = 50)	Post (n = 50)
Gender	Male	66 %	70%
		34%	30%
Female			
Age	(mean in years)	8.5	8.7
Insurance	Private	66%	62%
		30%	38%
Medicaid		4%	0%
	Self-		
Pay			

Table 2.

Documentation Differences in Electronic Health Record post-intervention using Chi-square

Documentation	Pre (n = 50)		Post (n = 50)		P-value
Asthma severity categorized	Yes	32%	Yes	100%	.011*
	No	68%	No	0%	
Asthma Action Plan	Yes	10%	Yes	74%	.001*
	No	90%	No	26%	
Asthma education	Yes	60%	Yes	98%	.000*
	No	40%	No	2%	
Follow up appointment	Yes	60%	Yes	94%	.000*
	No	40%	No	6%	
Controller Medication Prescribed (persistent)	Yes	58%	Yes	100%	.258
	No	42%	No	0%	
Control score	Yes	2%	Yes	98%	.000*
	No	98%	No	2%	
Spirometry	Yes	4%	Yes	32%	.011*
	No	96%	No	68%	
Communication to school nurse	Yes	4%	Yes	78%	.000*
	No	96%	No	22%	

P value <.05, Chi-Square