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Adherence to National Asthma Guidelines in a Pediatric Outpatient Clinic: Why Periodic Education Improves Adherence

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Abstract

Background: National standard guidelines for the treatment of chronic diseases are not always adhered to in outpatient practices even if the standards have had widespread exposure within the health care community.

Objective: To establish a process that clinic providers and staff could consistently follow to assure provider adherence to clinical practice guidelines for asthma for children living in Las Vegas.

Design/Methodology: A pre- post-chart audits of 50 asthmatics assessed provider documentation for asthma classification and treatment according to national guidelines. Once baseline electronic medical records (EMR) audit was conducted the healthcare providers and clinic staff received training on the use of asthma diagnosis and treatment national guidelines. A post-training EMR chart audit (3-months after the training) was conducted for a pre-post-training comparison.

Results: Post-training chart audits for the 50 pediatric patients showed there was a significant increase in accurate asthma diagnosis. There was 94% increase of children that had the C-ACT tool administered, and a 100% increase in the correct medications/spacers prescribed. A side benefit of the post-training chart review revealed awareness that only 32% of asthmatics were well controlled.

Conclusion: This QI initiative demonstrated a mechanism implemented can result in the use of evidence-based asthma guidelines by provider/staff. Initial in-service training has an immediate positive influence on provider practice regarding the use of practice guidelines but over time providers may revert to old practice habits without an ongoing mechanism to maintain best practices.

Implications for nursing: Periodic review of asthma guidelines increases healthcare provider/staff utilization of treatment protocols, which can standardize the organizational practice ultimately leading to improved patient outcomes.

Keywords

Asthmatic children, Outpatient setting, National guidelines adherence, Asthma best practices

Introduction

Poorly controlled pediatric asthma has a negative impact on children's health and can be a huge drain on the health care system. It is synonymous with increased emergency department visits, hospitalizations, unplanned physician visits, missed school days and parental loss of productive workdays [1]. Studies show that health care providers who follow evidence-based treatment recommendations and provide guideline-driven clinical care for asthmatic children

Table 1: Demographics of patients in project based on gender.

Gender					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Male	32	64.0	64.0	64.0
	Female	18	36.0	36.0	100.0
	Total	50	100.0	100.0	

result in positive patient outcomes in primary care settings [2].

The National Heart Lung and Blood Institute [3] guidelines for asthma management were developed over a decade ago, yet studies suggest a gap exist between asthma management and the use of the recommended NHLBI guidelines [4]. Improvement in asthma patient symptom control, quality of life and adverse event risks can only be achieved if clinicians adhere to clinical practice guidelines (CPG) [5], but CPG are not uniformly utilized among healthcare providers [6]. This project demonstrates that the use of a systematic process implemented in an outpatient practice resulted in greater adherence to utilizing national asthma guidelines in an outpatient pediatric practice.

Background Information

Clinicians in pediatric outpatient clinics are familiar with the evidence-based guidelines for treatment of asthmatic patients but they may lack written protocols to incorporate national guidelines in their practice. Perhaps this is due to pediatric healthcare providers feeling the guidelines for asthma do not address vital pediatric issues [7]. Others argue asthma guidelines are not perfect, but they are the best evidence-based clinical tools available to providers and patients [7]. There may be other reasons why clinical guidelines are not always followed, such as, awareness or familiarity of the new protocols. Some clinicians must overcome the barrier of "normal practice" versus the need for change. Another argument for nonadherence to CPG is due to mismatch goals for the provider and the patient/family, not to mention barriers of space, lack of educational materials, time, equipment, staff and financial resources. To understand the degree to which the CPG for asthma treatment was utilized the authors conducting an electronic chart review in an outpatient pediatric clinic in the southwestern area of the United States. The findings led to the development and implementation of an evidence-based protocol for clinical providers caring for pediatric asthmatic patients and families.

Description and Sample

Ethics and human subjects protection

The project did not require separate IRB approval to carry out this quality improvement project. The protection of human rights was maintained throughout the implementation of this evidence-based project by removing the names and any other identifying data from the medical records before pre- and post-protocol data analyses were conducted. Additionally, the participants of this project were identified as the providers and the staff employed by this office. All processes for this project were in accordance with the clinical activities that are standard procedures and were consistent with established practice guidelines.

Participants and methodology

The pre-protocol electronic medical record (EMR) chart review of asthmatic pediatric patients selected all charts for patients between the ages of 5 and 8-years-old (Table 1). To identify these charts the lead author and the office manager entered key words into the ERM system in addition to the age parameters. The key words included: (1) Diagnosis such as cough, reactive airway disease, wheezing, bronchospasm, (2) Nonspecific asthma, and (3) Specific asthma diagnosis. Once the charts were identified the plan was to collect data including documentation of: the use of an asthma severity assessment (i.e., Childhood Asthma Control Test [C-ACT]), asthma controller medication use, medication adherence by patients, demonstration of correct techniques for inhaler use, and asthma patient education (Figure 1).

The initial search for the ERM charts reviewed at the pre-protocol assessment period included 445 patient charts that fit the above criteria. After reviewing each ERM chart 24 were eliminated due to the types of diagnosis. The 421 charts reviewed indicated these patients had a documented office visit within the last year, so a list of these patients was compiled to make up the asthma registry. This registry also contained key elements from the NAECPP and NHLBI guidelines that were used in this project and served as indicators for future EMR chart audits. Examples of some of the key indicators include specific asthma diagnosis, prescription of controller medication, patient asthma education. The patients listed in this registry were used to randomly select 50 patient records for review. It should be noted that prior to the implementation of the training protocol the C-ACT was not used by the providers in this practice, so the collection of C-ACT assessment documented was only conducted in the post-protocol data collection.

Findings from the pre-protocol EMR chart review indicated

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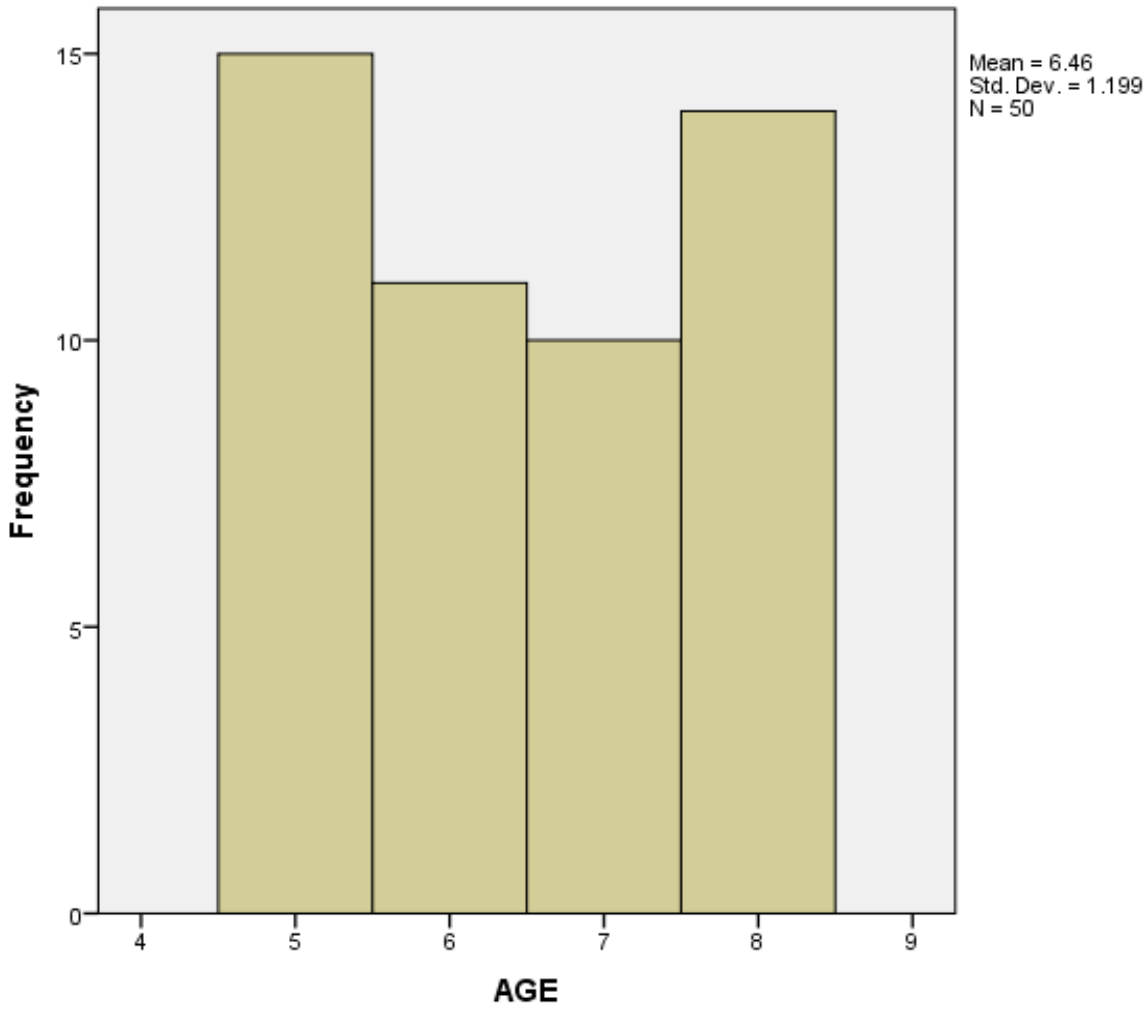

Figure 1: Participants by age.

inconsistencies existed in documentation among providers for: (1) Asthma severity, (2) Asthma classification, (3) Asthma diagnosis listed in the problem list, (4) Time interval for routine asthma follow-up office visits, (5) Asthma control medications prescribed and (6) The provision of asthma education.

These findings indicated a need to put a protocol in place to assure the CPG were being implemented by the health care providers working in this outpatient setting. The lead author determined the National Asthma Education and Prevention Program (NAEPP) Expert Panel Report (EPR) 3: Guidelines for the Diagnosis and Management of Asthma (2007) and the guidelines developed by the NHLBI be utilized as a guide to develop the protocol for this practice.

The development of the asthma protocol was based on the "Model for Improvement." The model comprises two equally important parts. Part 1 covers three fundamental questions that are essential for guiding work improvement: (a) What objectives does the protocol desire to accomplish? (b) How will the changes be evaluated? and (c) What changes can be recommended that will result in improvement? Part 2 of the model involves the Deming's Plan-Do-Study-Act (PDSA) cycle [8] that tests and implements a change in real-work settings.

During the planning stage, the lead and the office manager made appointments for a random group of patients identified and for whom data were collected from the chart review. The CPG were put together in a way that could be delivered within the allotted appointment time for each of the asthmatic patients. The plan was to have the providers see these randomly selected patients to implement (the "do stage" or part 2) the asthma management protocol.

Before the providers could implement the CPG, the lead author determined he needed to conduct training for the clinic providers and staff who would be working with the asthmatic patients. Prior to the training session the asthma protocol was introduced in the form of fliers posted strategically in several places around the outpatient setting. The training was attended by three physicians, seven nurse practitioners and fifteen certified medical assistants. The pediatric pulmonologist served as the content expert and was consulted for the ongoing design and implementation of the asthma protocol.

Quality improvement training

The training sessions were structured to align with the EMR documentation of subjective/objective data, assessment

and diagnosis, patient education and discharge instructions. The provider and staff were trained during scheduled staff meetings. During these training sessions discussions about documenting the correct asthma diagnosis and asthma severity levels were emphasized. Finally, healthcare providers were also reminded about the importance of providing patient education which also encompassed information on SABA and controller medications prescribed and documenting such in the patient's EMR. The role of the staff was to review the ERM to assure the pertinent information were entered into each EMR at the time of the patient's visit.

The post-training chart review of the subjective/objection patient data assessed for entries that included information of known asthma triggers, prescribed medications including the frequency of a rescue inhaler (short acting beta agonist [SABA]), and emergency room or hospital visit. The C-ACT assessment completed, and score recorded.

Tools/Instrumentation

The tools that were used included the Childhood Asthma Control Test (C-ACT) to assess asthma symptoms, and the patient education factsheets to reinforce patient teaching.

Childhood Asthma Control Test (C-ACT)

The C-ACT is a 7-item patient-based self-evaluative assessment tool used to determine asthma control in children ages 4-11 year of age [9]. This abbreviated version of the tool was adapted from the longer version which contained 27 items. The C-ACT is able to validate the assessment of asthma control ($F = 36.89$, $p < 0.0001$), the need for change in patient's therapy ($F = 20.07$, $p < 0001$) and % predicted FEV1 (F-2.66, $p = 0.0494$). Using the cut off score of < 19 to indicate inadequate asthma control provided statistical analysis which indicated 74% for specificity and 68% for sensitivity [10].

The possible total score ranges from 5 to 25, and a score of ≤ 19 indicates suboptimal control. C-ACT identifies an area of quality of life, the frequency of symptom severity, the frequency of a short acting beta-2 agonist (SABA) use and the self-perceived asthma control. The C-ACT questionnaire is a valid, easy to use tool that provides evidence to support clinical decision-making [11]. C-ACT is not a comprehensive test, instead it complements other assessments obtained during the visit. This tool was selected because of its ease to administer and the clinic staff are familiar with the use of this tool.

Patient education

Asthma education improves patient compliance with medication use [12] and improves the morbidity pattern [13]. Asthma self-management education is important to the control of asthma. Education directed toward asthma self-management emphasizes patient participation in symptom monitoring and control. Regarding patient education, the 2007 NHILBI guidelines recommended asthma education should be provided at every patient encounter by all providers and all points of care [14]. In keeping with the NHLBI recommendation, during each clinic visit, asthma patient education was provided and documented in the EMR by the clinical providers once the incidental teaching and patient handout were given to the patient.

The teaching by the providers during the office visit included the web-based Center for Disease Control and Prevention (CDC) factsheets on *Asthma Facts for Kids* and *How to Use Your Inhaler* were provided to patients in either English or Spanish. These patient educational materials were selected because they were easily accessible on the internet, regularly updated, available in bi-lingual formats and they are in the public domain [15].

Data Collection Procedure

Post-protocol data collection for this project included retrospective chart review data to determine the extent that the CPG for asthma care was being documented. After the educational sessions for the providers and staff were conducted post protocol CPG data were collected for the same patients used in the pre-training audit review. The post-training data collected included two additional areas of data collection, the C-ACT scores, and acknowledgement of patient teaching. All other post-training data collected mirrored the data collected in the pre-training audit. The descriptive data analyses included percentages, frequencies, and correlations utilizing the Statistical Package for Social Sciences (SPSS, version 24.0). The comparisons of pre- and post-project data utilized paired-t test and Mann Whitney U test. Comparisons were made for data collected pre- and post-protocol to determine the effectiveness of the training sessions. It was hoped that there would be improvements in the way providers and staff entered the data into patients' charts (see Table 2 for the timeline for this project).

Results

The same 50 ERM charts used for the pre-protocol analysis were used in the post-protocol analysis so comparisons could be made. Coding the data collected for both the pre- and post-protocol were also the same: 1 = Yes the parameter in question was covered and 0 = No the parameter was not met. Demographic data were coded as: 0 = make, 1 = Female, for asthma severity a score 0 = Not applicable, 1- Poorly controlled, 2 = Not well controlled, and 3 = Well controlled. All

Table 2: Timeline for project implementation.

Phase	Milestones	Timeframe
1	Pre-implementation EMR Chart review	1-2 weeks
2	Announcement of the DNP project, Asthma Protocol to staff	1 week
3	In-service to providers and clinical staff. Begin using the Asthma Protocol	2-3 weeks
4	Post-implementation EMR chart review	1-2 weeks

not applicable responses were coded as 0, to avoid influence of the means. A summative score was subsequently obtained for the two EMR reviewers by adding all dimensions across the 50 patient charts, thus yielding a composite sum score with a possible range from 0-8 per chart review. The higher the EMR score suggested the parameters were appropriately covered with patients during office visits, whereas a lower score suggested that not all parameters were appropriately covered.

Discussion of Finding

The same fifty EMR charts were audited at pre-training and again at the post-patient education period. Of the 50 EMR charts that were reviewed (pre-post patient education), 64% were males and 36% were females, 30% were in the 5-years of age group, and 28% were in the 8-years of age group.

Pre-training-post-training audit findings

The pre-patient education it was noted that the chart audits showed the practice had a quality gap. The pre-patient education findings showed that there were 0% asthma severity specific diagnosis documented in the EMR patient charts but there was a significant increase in documentation in the post-patient audit. There was a 94% improvement for documentation for the use of C-ACT assessment, but this was due to the initiation of this assessment tool after the training was conducted. The results of the C-ACT assessment indicated that 50% of patients were not well controlled, 32% were well controlled, 12% were poorly controlled, and in 3% of the time the provider or staff failed to include this information into the patient's EMR.

Performing cross tabulations of post-patient education C-ACT scores and gender showed about 20% of asthmatic males were poorly controlled, while about 55% of females were not well controlled. The findings indicated an equal percentage of males and females (30%) were well controlled. The post-education audit also found that asthma severity was classified as mild asthma for 70% of patients and moderate asthma for 30% of children. The findings of post-education data indicated that between genders and mild asthma severity for males was 60% and for females it was 78%, while there were 22% of moderate asthma control indicated for both males and females.

The findings of the post-provider/staff education chart review indicated that controller medications were prescribed 92% of the time and 8% of the time they were not prescribed. The findings of the pre-provider/staff education chart review showed 2% of the time there was a documented controlled medication prescribed. The findings of the pre-provide/staff education char review indicated there were 0% asthma education documented and post-provider/staff education chart review showed there were 100% documentation of asthma education provided to patient/parents by the providers in the office. Additionally, the findings showed the pre-provider/staff education chart review indicated the documentation of spacer device use was 0% and the post-provider/staff education chart review indicated that the documentation of prescribed spacer device was 100%. The pre- and post-provider/staff education indicated that a rescue inhaler was prescribed 100% of the time post-education chart review, this coincides with several national asthma guideline recommendations for SABA use as the first step treatment of asthma [16].

Significance/Implications for Nursing

The results of this pre-training/post-training audit indicated the importance for correct documentation to provide a clear diagnosis and severity rating of asthma based on NAEPP guidelines and a reason for the clinic visit. This documentation provides a process for providers to follow to promote quality patient outcomes. The results of this QI assessment indicated the need for clear diagnosis and treatment during office visits so there is continuity of care across provides caring for patients in the same practice. The findings of the pre-training/post-training audits demonstrated the importance of providers and medical staff training on the asthma guidelines of existing or new protocols to improve the quality of the organizational practice and patient outcomes. Because of this QI assessment the office setting has a protocol in place to manage patient with a diagnosis of asthma.

The burden of pediatric asthma continues to be a significant problem due to the challenges primary care pediatricians face in implementing asthma guidelines. But this QI intervention proved the use of evidence-based asthma protocol can bring a change in providers' behavior by increasing their knowledge, skill, and self-efficacy in managing pediatric asthma using NAEPP guidelines.

Limitations

There were several limitations that are worth mentioning. The first is the eight parameters tool was not tested for reliability or validity. The eight parameters were from the 2007 NAEPP EPR 3 guidelines, and the documentation in the EMR did not always follow the national guidelines. During the analysis of the pre-training chart audit it was noted that asthma severity as mild, moderate and sever were not clear, for example intermittent and persistent asthma diagnosis were combined so the stage of asthma severity may have been oversimplified. The required timeframe of the QI assessments could be another limitation because the data for the post-training may have occurred too soon after the educational training. Three months post-training designated as the data collection period may have been too soon to collect data and the project team realize that a longer period between intervention and data collection may have revealed a different finding. Another limitation was the small number of charts that were reviewed so the findings of this report cannot be generalized to other outpatient practices.

Conclusion

The findings of this project reinforce the idea that practice guidelines require a conscious effort to implement because there are too many distractions or barriers that can hinder best practices regardless of provider awareness of existing standards guidelines. The long- term goal of this QI

initiative is to do another audit six-months post provider/ staff intervention to assess ongoing adherence to standard guidelines. It is anticipated that periodic reminders or updated educational offerings will be needed to maintain the level of compliance equivalent to best practices.

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