Pediatric Asthma Quality Improvement Project: Using Standardized Asthma Management Tools to Improve Care

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INTRODUCTION The Utah Pediatric Partnership to Improve Healthcare Quality (UPIQ) and the Utah Department of Health (UDOH) Asthma Program Learning Collaborative partnered to improve asthma management and asthma care through the systematic use of two pediatric asthma management tools, the asthma control test (ACT) and the asthma action plan (AAP), during each pediatric primary care visit for relevant patients. The goal of the initiative was to increase provider usage of the ACT and AAP and their documentation in the EHR to 70% within 3 months of implementation.

METHODS The project implementation team developed and implemented a systematic stepwise approach for use of the ACT and AAP. Both tools were embedded into the electronic health record to improve use and documentation of the ACT and AAP for each asthma patient. Baseline data was collected through chart reviews of pediatric asthma patients who were seen during the 3-month period prior to project implementation. Outcome data was collected during the 3 months after initiation and compared to the baseline data to assess the effectiveness of the protocol.

RESULTS Our analysis included 85 patient encounters over a 6-month period, 3 months pre-intervention (46 qualifying patients) and 3 months post-intervention (38 qualifying patients). After implementing the asthma management protocol, the percentage of patients with an AAP documented in the EHR doubled from an average of 20% to an average of 40%. The percentage of patients who completed an ACT at the time of their visit increased from an average of 35% in the three months pre-intervention to 57% in the three months post-intervention (a 63% increase).

CONCLUSION The Asthma Quality Improvement Project (AQIP) initiative led to an increase in utilization of standardized asthma care tools. However, the intervention protocol was not adopted by all providers uniformly. While we fell short of our goal of 70% provider adoption within a 3-month period, we did accomplish our overarching objective to increase the number of patients completing an ACT and receiving an AAP as part of their visit. The next critical step in the PDSA cycle is to implement targeted interventions for providers with lower usage rates of the standardized asthma management tools to ensure consistent asthma care for all patients, regardless of their provider.

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Introduction

Asthma is a common respiratory disease affecting 25 million people in the United States (US), including 4.6 million children (CDC, 2024a). Nationally, 6.5% of children have a diagnosis of asthma, whereas the prevalence of pediatric asthma in Utah is 26% higher at 8.4% Utah's pediatric population. Of children in the US with asthma, approximately 39% have had an asthma exacerbation in the last year (CDC, 2024a).

There are two asthma management tools that help improve and standardize the care of patients with asthma in the outpatient setting: the Asthma Control Test (ACT) and the Asthma Action Plan (AAP). The ACT is a survey completed by patients and their families which consists of a rating scale that helps to quantify a patient's asthma severity and current asthma burden. These surveys give providers insight into a patient's level of asthma control, allowing for early intervention when control is poor. There are two versions of ACT, one for children 4-11 years old, referred to as the Childhood Asthma Control Test (C-ACT), and one for children 12 years and older.

An AAP is an individualized written plan developed with the patient's provider that outlines how to manage asthma symptoms and when and where to seek help. The Centers for Disease Control and Prevention (CDC) recommends that all patients with asthma have an Asthma Action Plan, personalized based on the patient's history of asthma, known triggers, and previous exacerbations (CDC, 2024b). One study showed that developing a written AAP for patients led to decreased asthma events, improved treatment compliance, and overall increased quality of life for children and parents (Bansal, 2023).

The Utah Pediatric Partnership to Improve Healthcare Quality (UPIQ) and the Utah Department of Health (UDOH) Asthma Program Learning Collaborative partnered to improve asthma management and asthma care outcomes by increasing usage of ACTs and AAPs with pediatric patients. This paper describes the development and implementation of a quality improvement (QI) initiative focused on enhancing asthma care by utilizing the Asthma Control Test and the Asthma Action Plan in the management of pediatric asthma patients.

Problem

A chart review of children diagnosed with asthma in an outpatient pediatric care facility during a 3-month period identified that only 20% of these patients had documentation of an AAP, and only 35% had a documented ACT. The baseline data reflected an inconsistent use of standardized asthma management tools among providers at the practice site.

Purpose and Aim of the Initiative

The purpose of the Asthma Quality Improvement Project (AQIP) was to improve the management of pediatric patients with asthma through the systematic use of AAPs and ACTs. The ultimate goal of these efforts was to improve asthma care in the outpatient setting and reduce emergency department visits and hospitalizations related to asthma exacerbations.

The aim of the AQIP was to achieve a 70% provider adoption rate for each of the

standardized asthma management tools within three months of implementation.

Methods

Context

The AQIP initiative was conducted at an academic pediatric practice site in Salt Lake City, Utah. The site is a major satellite clinic of the University of Utah, the region's primary academic health system. This practice has seven primary pediatric providers, as well as additional providers who rotate through less frequently. There was an average of 14 visits per month qualifying for analysis.

Population

The population for the AQIP consisted of pediatric patients with asthma seen at the practice, identified by one of the following in the electronic health record (EHR):

- Asthma listed in their problem list
- Albuterol listed in their medication list

Qualifying visits could be visits scheduled specifically for asthma management, or, more commonly, well-child checks or visits scheduled for other acute concerns.

QI Implementation Team

The QI team comprised stakeholders in the practice impacted by the asthma QI process, which included physicians, medical assistants (MAs), and practice administrators.

Baseline Data

Baseline data was collected through chart reviews of pediatric asthma patients who were seen at the practice during the 3-month period prior to implementation which included 46 patients.

Outcome Data

Outcome data was collected through chart reviews of pediatric asthma patients who were seen at the practice during the 3-month period after implementation. This included 38 patients. This data was analyzed monthly and later aggregated and compared to baseline data.

Intervention Plan

Asthma Management Tools

The AQIP plan specified that for every child with a diagnosis of asthma, clinical providers would use the C-ACT for children 4-11 years old and the ACT for children 12 years and older and document an AAP in the EHR.

Integration of Asthma Tools into the Electronic Health Record. The project implementation team developed three EHR shortcuts, or dot phrases, to standardize and improve convenience in providing asthma care. The first dot phrase enabled a patient's ACT score to be easily documented in the clinic visit note. The second dot phrase allowed providers to insert an AAP template into a patient's after visit summary. The third dot phrase allowed clinicians to provide additional resources to families of patients with poorly controlled asthma.

Staff Education

Prior to implementation, MAs completed training on the AQIP protocol. Training details included the criteria to determine which patients qualify for an ACT or C-ACT, and how to assign the appropriate ACT to a pa-

tient's EHR, which would then alert the patient to complete the ACT in advance of their visit. MAs were trained to pull up the survey in the exam room if the ACT had not been filled out prior to the patient arriving so that a guardian could complete the ACT while waiting for the provider.

Intervention

The project implementation team developed a systematic stepwise approach to how the ACT and AAP should be incorporated into the management of pediatric asthma patients. To initiate the AQIP protocol, the improvement team sent an email correspondence to pediatric providers at the practice site informing them about the asthma management improvement initiative and detailing the steps of the new approach. Providers were asked to begin implementing the protocol immediately. The following is the devised "1-2-3 method" for improving asthma patient care:

1. The MA invites the patient to complete an ACT before a clinic visit. If there is not a completed ACT in the EHR prior to the patient arriving, the MA completes the ACT with the patient and guardian during the rooming process.
   a. Providers then insert the ACT into their clinic documentation with the use of a dot phrase in the EHR.
2. Using the ACT and input from the patient, the provider creates an AAP that is easily inserted with a dot phrase into the after-visit summary. The AAP is accessible in each patient's EHR.
   a. The patient receives a printed copy of the AAP to reference at home.

3. For patients with poorly controlled asthma (more than 3 exacerbations, hospitalization in the last six months, or no improvement in symptoms after recent change in medication):
   a. The provider:
      i. refers the patient to the Asthma Home Visiting Program, and
      ii. documents the referral in the EHR.
   b. Instructions for participation in the Asthma Home Visiting Program are placed in the after-visit summary using the available dot phrase.

Outcome Measures

The AQIP identified three process measures to assess the degree to which the AQIP outcomes were achieved:

- Percentage of pediatric asthma patients with an ACT documented in their electronic health record each month.
- Percentage of pediatric asthma patients with an AAP documented in their electronic health record each month.
- Percentage of providers at the practice that documented in the EHR an ACT or AAP for pediatric asthma patients.

Ethical Considerations

All patient data was de-identified. The project did not receive any financial support or sponsorship, and there were no identifiable conflicts of interest.

Results

Data for our analysis was obtained through a chart review of 85 pediatric asthma patient encounters at our practice during a six-month

period. Baseline data was collected from patient encounters that occurred over a 3-month period prior to implementing the AQIP protocol (46 qualifying patients). Outcome data was obtained via chart review for 3 months post-initiation of the AQIP protocol (38 qualifying patients) and compared to the baseline data to determine the success of the initiative.

Asthma Control Test Documentation

The percentage of asthma patients with an ACT documented in the EHR during their visit increased from an average of 35% in the three months pre-intervention to 57% in the three months post-intervention, an increase of 63% (**Figure 1**).
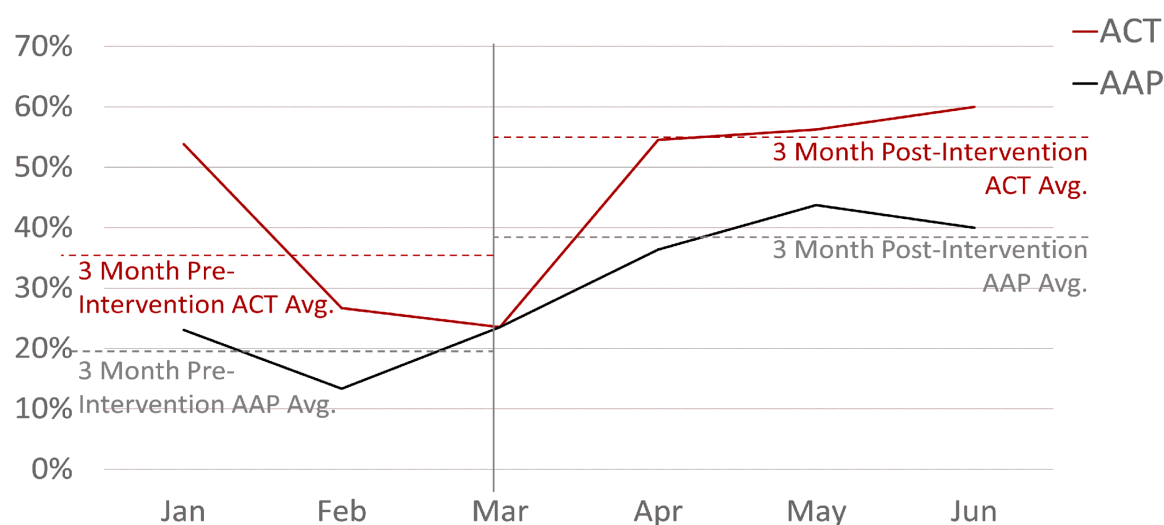
Asthma Action Plan Documentation

The percentage of asthma patients with documentation of an AAP in the EHR increased from an average of 20% in the three months pre-intervention to 40% in the three months post-intervention, an increase of 100% (Figure 1).

Provider Adherence to the Project Protocol

The percentage of providers documenting at least one standardized tool (either ACT or AAP or both) increased from 45% in the three months prior to intervention to 60% in the three months after intervention.

Figure 1. Utilization of ACTs and AAPs Pre- and Post-Intervention

AAP=asthma action plan; ACT=asthma control test

Discussion

The AQIP implementation team developed a simple and integrated process for clinicians to provide standardized asthma care, and the intervention was initiated with an email to pediatric providers outlining the new process and emphasizing the importance of outpatient asthma care in preventing exacerbations and hospitalizations. The initiative led to better standardization of asthma care. We saw a 63% increase in the percentage of pediatric asthma patients with an ACT documented at the time of their visit, and the percentage of

asthma patients with documentation of an AAP doubled.

While we fell short of our aim to achieve 70% provider adoption of standardized asthma measures, we achieved a good start to increasing the use of the ACT and AAP to improve asthma care.

Next Steps

We saw significant improvement in the percentage of patients completing an ACT and receiving an AAP during a visit after one email to providers. However, providers will need continued reminders to remain consistent in implementing the AQIP standardized outpatient asthma care approach. We recognize the delicate balance of sending reminder emails frequently enough that providers are reminded about our efforts but infrequently enough that emails are not ignored. We are still determining the best methods for timing and content of emails and other vehicles for reminders and education of providers.

Additionally, we found that usage rates of standardized asthma measures varied depending on the provider. With continued data trending, we would like to develop a system to provide targeted information and reminders to providers and MAs with lower rates.

Internal medicine and pediatrics providers who were not involved in our asthma QI efforts expressed interest in participating in our initiative. We are working towards including these providers in our efforts at standardization. If successful, we plan to include the family medicine providers at the practice as well.

Finally, we believe that standardization of the stepwise approach to asthma management in the EHR would help improve providers' use of the tools and documentation in the EHR. It would be helpful to implement a system to notify providers that an ACT has been filled out so they can review it with the patient in the clinic. This review could help providers transition to creating or updating a patient's AAP during the visit.

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