

Implementation of a Provider's Asthma-specific Note to Optimize Billing in the Pediatric Emergency Department

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Abstract

Introduction: There is broad variability in provider documentation for asthma encounters within the pediatric emergency department. Inadequate provider documentation leads to discrepancies between the ideal current procedural terminology (CPT) code and the assigned CPT code based on the care provided. Multiple studies demonstrate improvement in medical provider documentation after implementing standardized documentation templates and educational programs. The primary aim of this project was to improve the concordance between the ideal CPT code and assigned CPT code from a baseline of 71% to 85% in 12 months. **Methods:** We introduced an asthma-specific note template in January 2018. We reviewed a random sample of 20 encounters per month to compare the ideal and assigned CPT codes in the baseline and intervention periods. The primary outcome measure was the percentage of encounters with agreement between ideal and assigned billing. The secondary outcome measure was the percentage of encounters with intravenous magnesium that were billed for critical care. The process measure was asthma note usage. Provider education and Plan-Do-Study-Act (PDSA) cycles continued throughout the intervention period. We used statistical process control to measure changes over time. **Results:** We reviewed 740 patient encounters over a 12-month baseline and 25-month intervention period. The average agreement between ideal and assigned CPT code increased from 71% to 89%, with 84% usage of the asthma note template. The percentage of critical care billing for intravenous magnesium increased from 15% to 55%. **Conclusion:** Implementation of an asthma-specific provider note template in the pediatric emergency department improved billing optimization and critical care billing. (*Pediatr Qual Saf* 2022;7:e544; doi: 10.1097/pq9.000000000000544; Published online March 30, 2022.)

INTRODUCTION

The accuracy of medical provider documentation correlates with improvements in revenue generation and quality metrics.¹⁻⁵ Research shows improvement in medical provider documentation after implementing standardized documentation templates and education programs focused on the documentation process.^{3,6,7} Multiple studies demonstrate both thorough and accurate medical provider documentation correlates



with the assignment of the most appropriate billing codes, and subsequently, an overall, more precise reimbursement process.^{1,2,4,8}

The potential for more accurate documentation and its consequent effects on revenue generation is particularly relevant in the current healthcare climate, with an increased focus on quality and efficiency in healthcare services. Recent early evidence of significant financial deficits resulted from decreased patient volume and services provided during the SARS-CoV-2 pandemic, especially within emergency departments.⁹⁻¹¹ The ability to accurately document the care and services provided has become an even more pertinent aspect of the reimbursement process.

At our institution, an external audit disagreed with our internal coding in nearly one of five encounters. The external audit assigned a higher level of service for almost 80% of the discrepant encounters. Encounters for asthma management are common within pediatric emergency departments (PEDs) and consequently chosen as a specific area of focus. In addition, the American Medical Association (AMA) has a published CPT guide for asthma encounter coding based on the therapy provided (Table 1). An internal review of medical provider documentation for asthma encounters within the PED revealed discrepancies between the ideal AMA CPT code and the actual CPT code assigned to each patient encounter.¹²

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These discrepancies included numerous patient encounters which met AMA CPT coding criteria for critical care billing but were assigned a lower CPT code. Criteria for critical care billing include bedside care, documentation, family discussion, data review, and specialist consultation that occurs during acute patient management and exceeds 30 minutes. Unlike other adjunctive therapies for severe asthma, such as beta-agonist infusions, patients who receive magnesium infusions are often admitted to pediatric inpatient units at the study institution, making it less apparent that critical care decision-making occurred. Our internal review and found that providers documented critical care time in a minority of encounters with magnesium. Thus we decided to focus on improving critical care billing for encounters with magnesium administration, specifically.

Discrepancies in CPT coding can be attributed to inaccuracies by the coding department or insufficient medical provider documentation to meet AMA CPT coding requirements. Internal review of asthma note documentation, found broad variability in provider documentation within the various elements of the note (eg, history of present illness, review of systems). For this reason, provider documentation was the main focus of this quality improvement project. We developed a standardized asthma-specific note template to optimize coding accuracy, and thus billing, based on the care provided.

The primary aim was to increase the agreement between ideal and assigned CPT codes from a baseline of 71%–85% over 12 months. The secondary aim was to increase the proportion of encounters billed for critical care time among patients who received intravenous magnesium for acute asthma exacerbation from a baseline of 15% to a target of 40% over 12 months.

METHODS

Context

Our hospital is a suburban, tertiary care PED with approximately 60,000 pre-pandemic annual visits. The department is staffed with resident, fellow, and attending physicians, along with physician assistants (PA). A trainee or PA sees most patients before being seen by an attending physician. The project was deemed exempt from review by the Institutional Review Board. We created a task force comprising three PED physicians, one hospital revenue manager, and three PED coders in August 2017

to evaluate provider documentation within the PED. In the fall of 2017, this group met to identify key drivers for adequate billing. The coders reviewed the most commonly deficient aspects of the note and documentation requirements for each AMA CPT code level of service (level 1–5). They found that the most common note deficiencies were an incomplete review of systems, past medical history, and physical examination. In addition, the coders described broad variability in critical care time documentation and specifically failure to document the minimum time of 30 minutes necessary for critical care billing. The PED providers examined standardized provider notes from other institutions publicly available in the Epic community library (Epic, 2017) to generate ideas on scripting and electronic health record (EHR) tools used to ensure complete documentation.

Interventions:

We designed the asthma-specific note template to address the most commonly missed note elements needed for adequate billing: a complete review of systems, past medical history, and physical examination. We included instructions in the note that stated how many elements were necessary for a full review of systems and physical examination. Likewise, the past medical history component included a selection tool whereby the provider would either select no significant past medical history, free text the medical history, or pull in data from the electronic medical record history section. We also added instructions that reminded the provider to incorporate a differential diagnosis and analysis of the laboratory and imaging studies into the note’s medical decision-making (MDM) section. We added standard phrasing for MDM based on the algorithm in the asthma pathway highlighting the severity of the asthma exacerbation. Lastly, we added a section for critical care documentation, including an outline of patient eligibility for critical care billing and a prompt to remind the provider to document the critical care time, if applicable. We presented the asthma-specific note template to all clinical staff in December 2017 with a review of CPT coding requirements and critical care eligibility criteria. We implemented the note within the EHR in January 2018.

We performed quarterly PDSA cycles throughout the intervention period. For each PDSA cycle, we held meetings with the hospital coders to review a random sample of charts. When the assigned billing was discrepant with

Table 1. Adapted from the 2016 AMA CPT Emergency Medical Service Continuum Model for Asthma Assuming Adequate History and Physical Examination Documentation with our Hospital Charges

Severity of Illness	Treatments	Ideal CPT Code	2019 Charges
Mild	1 albuterol treatment	99283	\$534
Moderate	2 albuterol treatments, one hour of continuous albuterol	99284	\$893
Severe	3 albuterol treatments, ≥ two hours of continuous albuterol, 1 h of continuous albuterol + at least one other albuterol treatment	99285	\$1334
Critical Care	Additional therapies such as ketamine, magnesium sulfate, parenteral adrenergic agents, heliox, endotracheal intubation, or BiPAP	99291	\$1609

the ideal billing, the hospital coders outlined what specific areas of documentation were deficient. Modifications were made to the note template to address these deficiencies.

In the first PDSA cycle, the coders noted that the follow-up plan was frequently incomplete. To bill a level 5 visit, a follow-up plan needs to include whom and when the patient should follow up. The first modification to the follow-up plan added instructions from the discharge paperwork into the note, but upon further review, we found that these instructions often did not state timing for the follow-up. Therefore, we added note scripting with a prompt to identify with whom and when a patient should be seen.

During the second PDSA cycle, the coders found that the MDM was discrepant with the care provided. The initial scripting for the MDM prompted the provider to select mild, moderate, or severe exacerbation. Often the provider selected this based on the initial branch of the asthma pathway and not the ultimate diagnosis. For example, a patient who initially was in moderate distress but ultimately had two hours of continuous albuterol was labeled a moderate exacerbation even though the treatment was for a severe exacerbation. We changed the scripting so that the number of administered albuterol treatments drove the patient's severity classification.

Finally, during the third PDSA cycle, we focused on increasing the utilization of the asthma note. Best practice alerts automatically appeared for every patient on the asthma pathway, notifying the provider the asthma note should be used. This was simply a reminder to prompt use of the asthma note, which a provider may or may not choose to disregard. We first targeted these best practice alerts toward the resident physicians and later expanded them to include the PAs. We presented ongoing data and findings at departmental meetings to re-educate providers on optimal documentation.

Analysis

The primary outcome measure was the percent of encounters agreeing between the ideal CPT code and assigned CPT code. The secondary outcome measure was the percent of encounters with critical care billing when intravenous magnesium was utilized for an acute asthma exacerbation. The primary process measure for this project was the percentage of encounters where providers used the asthma-specific note.

We included encounters with patients older than 2 years of age with a history of prior wheezing presenting to the emergency department with asthma symptoms and a final diagnosis of asthma. These criteria mirrored the asthma pathway and, therefore, the asthma-specific note template BPA. We exclude any encounters with patients born prematurely (less than 37 weeks gestational age) and patients with a complex past medical history that could affect asthma presentation or outcomes, such as vocal cord dysfunction, underlying cardiac disease, and obstructive sleep apnea. We reviewed the medical provider note documentation and the medical record for these criteria.

We compared provider documentation over a 12-month baseline (January 2017–December 2017) and a 25-month intervention period (January 2018–January 2020). We reviewed the provider documentation in detail for a random sample of 20 patient encounters per month that met inclusion criteria. We manually reviewed each patient encounter and allotted an ideal CPT code compared with the assigned CPT code. We determined the ideal CPT code based on the AMA CPT coding guidelines, which are dependent on the number and type of respiratory treatments (Table 1).¹² We determined the number and type of respiratory treatments administered in the PED by reviewing the medicine administration record (MAR) and cross-referencing the documentation in the provider note. If information from the MAR regarding the number and type of treatments did not match the information documented in the medical provider note, we used the MAR preferentially. The assigned CPT code was the actual code used to bill the patient's insurance company. We identified patients eligible for critical care billing based on documentation of magnesium administration in the MAR.

We evaluated the difference between ideal and assigned billing charges in the baseline and intervention periods. The five billing codes correlate to a specified aggregate charge based on the study institution's procedure code dictionary (database for all billable items) (Table 1). The difference in charges between billing codes is significant and compounds quickly when applied to several encounters. In 2019, the difference in charges between a level 3 and level 4 visit was \$359.00, and between a level 4 and 5 visit was \$441.00. In 2019, the difference between no critical care time billed and 30–60 minutes of critical care time was \$1,609.00.

We tracked all outcome and process measures using p-charts, graphed monthly. No patients received intravenous magnesium in August 2018, and therefore, this data point was removed from the corresponding p-chart. We applied standard rules to determine if changes were common or special cause variation.¹³ We created statistical process control charts using QI-charts V.2.0.23 software (Scoville Associates, 2009) for Microsoft Excel (Microsoft, 2016).

RESULTS

We analyzed 240 patient encounters in the baseline period and 500 in the intervention period. In the baseline period from January to December 2017, the average agreement between ideal and assigned CPT codes was 71% (Fig 1). We noted special cause variation starting in March 2019 with a shift in the centerline from 71% to 89%. Critical care billing for patients administered intravenous magnesium increased from a baseline of 15% to 55% (Fig 2). When the new note was implemented in January 2018, the centerline initially shifted from 15% to 41%. A second shift to 55% occurred in April 2019.

Figure 3 depicts the percentage of patient encounters in which the asthma-specific note template was utilized since

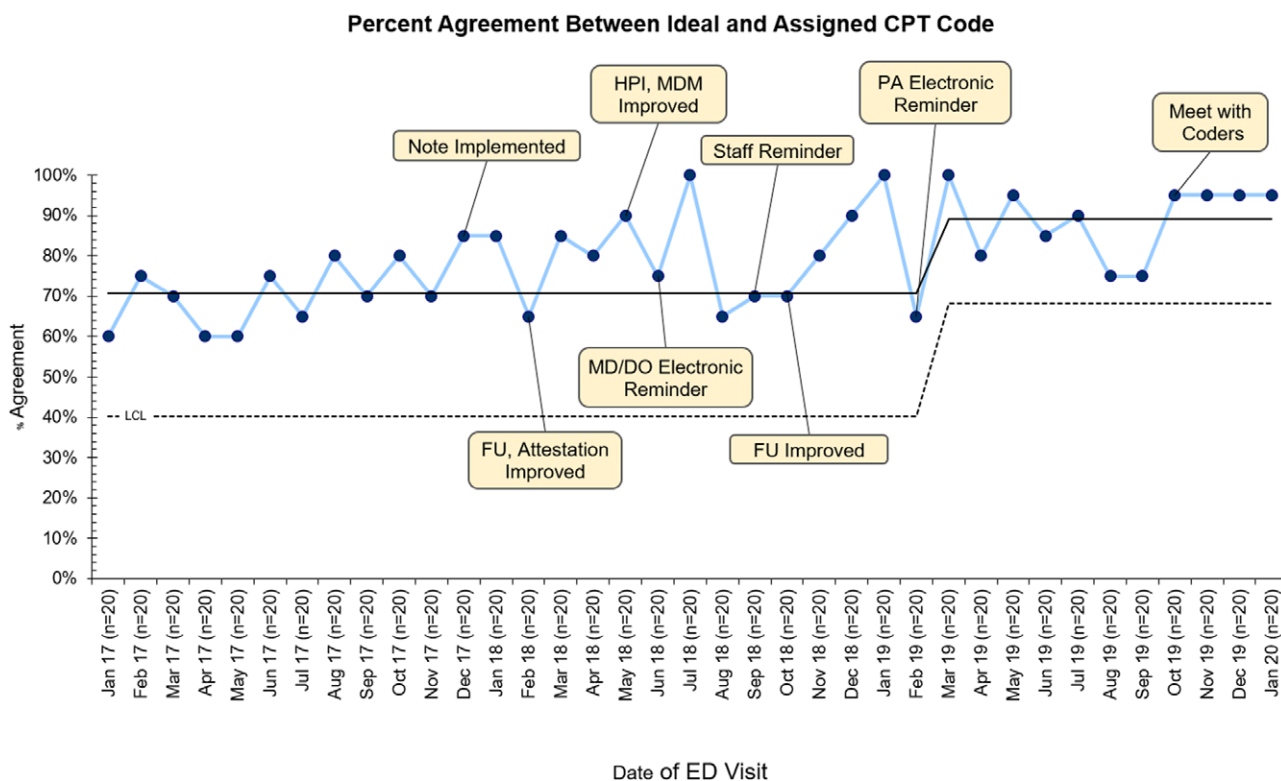


Fig. 1. P control chart showing the percentage agreement between ideal and assigned CPT codes pre and post implementation of a standardized asthma note template. LCL, lower control limit; FU, follow-up; HPI, history of presenting illness; MD, Doctor of Medicine; DO, Doctor of Osteopathic Medicine; PA, Physician Assistant.

its implementation in January 2018. Between January 2018 and April 2019, the note was utilized for 60% of patients. Note utilization increased further to 84% in May 2019.

When applied to all asthma encounters, the 18% increase in billing agreement from 71% to 89% (Fig 1) led to an increase in billing charges. For every 100 ideally level 4 visits based on the treatment provided, an 18% increase in billing agreement produced a \$6462.00 increase in charges (18 × \$359.00) (Table 1). Similarly, for every 100 ideally level 5 visits, an 18% increase in billing agreement led to an increase of \$7,938.00 in charges (18 × \$441). For every 100 patients who received magnesium, the 40% increase in critical care billing led to a \$64,360.00 increase in charges (40 × \$1609.00).

DISCUSSION

This project demonstrates the potential for optimized billing by implementing medical provider note templates, regular meetings with hospital coders, and increased provider education on documentation. Although numerous prior studies have shown similar outcomes for surgical specialties, in particular, this study focused on disease-specific documentation within the PED, which is an area of medical care in which rapid but thorough documentation is particularly key for optimized billing, given high patient throughput, volume, and acuity.^{1-3,6-8}

An external audit of all PED encounters showed 81% agreement between external coding and assigned CPT codes. During that same period, the baseline rate of billing agreement among asthma patients was only 71%. This suggests a baseline inconsistency within the institution’s coding department that is not unique to asthma encounters. The quarterly meetings with the coding team led to improvements in provider documentation and reinforced standardization among the coders. For example, in February 2018, we noted that some coders were billing a level 4 in place of a level 5 if there was no follow up documented based on their interpretation of the AMA CPT guideline requirement that “additional workup” be planned for a visit to be a level 5. When we added this to the note, there was a steady increase in billing optimization. However, in a subsequent PDSA cycle, we found that some coders only considered the follow-up adequate if it specified with whom and when the patient would follow-up, whereas others considered any follow-up documentation acceptable. In October 2018, we revised the follow-up documentation to standardize the phrasing, thus increasing billing optimization. The interplay between documentation and consistent coding practices delayed appreciable improvement until both factors improved in March 2019.

The improvements in CPT code agreement paralleled an increase in asthma note template usage, suggesting that a standardized note can lead to improved billing

Critical Care Billing for IV Magnesium Administration

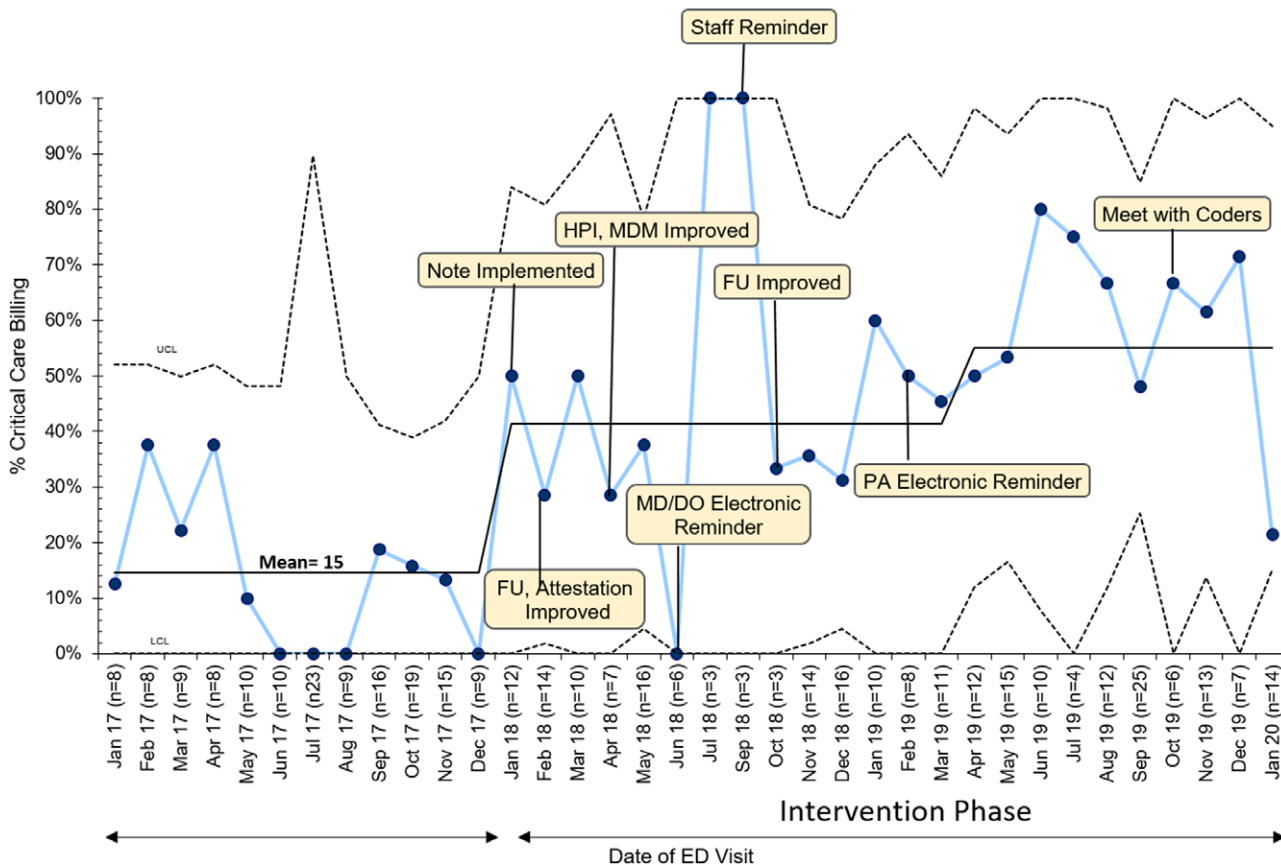


Fig. 2. P control chart showing the percentage of encounters treated with magnesium sulfate that were billed for critical care time pre and post implementation of a standardized asthma note. UCL, upper control limit; LCL, lower control limit; FU, follow-up; HPI, history of presenting illness; MD, Doctor of Medicine.

documentation. The addition of an electronic reminder prompting the provider to use the standardized note that first targeted resident physicians in June 2018, and later the PAs in February 2019, preceded periods of improvement in optimized billing and, ultimately special cause variation. The initial focus on resident physicians alone likely contributed to the protracted improvement course. We felt that resident physicians would need the BPA since they are only in the ED for 1 month at a time, and with each new rotation, they are faced with the competing demands of learning a new hospital system and medical management. The need for a BPA for the PAs was less apparent given they are a consistent provider group, and we believed the impact of education alone would be adequate. However, this was an incorrect assumption. PAs see a large portion of the asthmatic patients, and once we expanded the electronic reminder to utilize the standardized note to include the PAs, we observed sustained improvement.

Education is considered a level 1 reliability mode; this project demonstrates that changing provider documentation requires more complex interventions than provider

education alone.¹⁴ Documentation can be improved by adding automation through drop down menus and prompts. Standard wording also enables the coding department to interpret the care provided easily. For example, there was an increase in billing optimization as early as March 2018 after significant provider education. Changes to the note in May 2018 that automated the MDM and standardized documentation through drop down options and scripting led to further increases in billing optimization. In addition to making documentation more streamlined, this standardization likely made it easier to bill the encounter more accurately.

The secondary aim of the project focused on critical care billing proved more readily achievable than expected. We observed special cause variation immediately upon standardized note implementation, and we saw further improvement once note template usage increased with the implementation of an electronic reminder for PAs. We believe several factors make improvements in critical care billing more readily achievable. First, in our institution, the attending physician is the only person responsible for the critical care documentation. The attending group is a

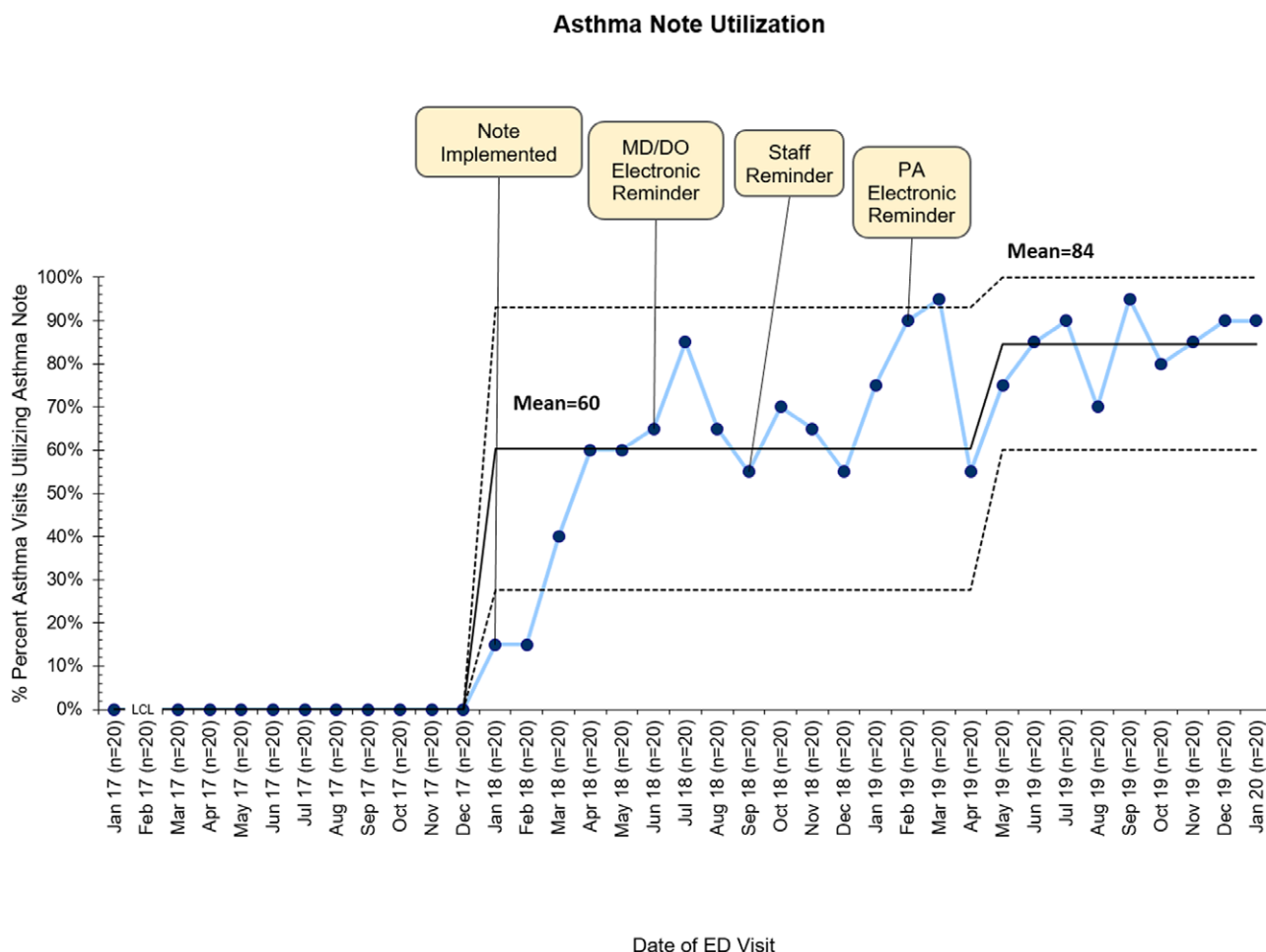


Fig. 3. P control chart showing the percentage of asthma encounters utilizing a standardized asthama note template. UCL, upper control limit; LCL, lower control limit; MD, Doctor of Medicine; DO, Doctor of Osteopathic Medicine; PA, Physician Assistant

more consistent pool of providers than the rotating residents. Second, this improvement focused only on a single portion of the note rather than the interplay of several parts of the note. Finally, the note template provided scripted wording and decision support, stating that all patients who receive intravenous magnesium and have more than 30 minutes of care qualify for critical care time. This aspect of the project was the most straightforward and the most impactful, with a 40% increase in optimized critical care billing. This standardized critical care documentation approach could be applied to several other diagnoses, including diabetic ketoacidosis, status epilepticus, and anaphylaxis.

This project has several limitations. First, we implemented an updated generalized note template within the EMR simultaneously as the asthma-specific note. In addition to the educational efforts employed throughout the intervention period targeting the use of the asthma note template, documentation improvements may also have been evidence of an overall increased awareness among providers of complete documentation. Second, this project was limited to one pediatric academic institution, and while its staffing model is similar to other academic

centers, this project may not apply to smaller, community-based hospital sites. Third, this project showed the interplay of provider documentation with hospital-based coders' application of that documentation. Therefore, some learnings may not apply to emergency departments that do not use coders to bill visits. Additionally, our revenue projections were based on estimates and not actual patient encounters. The actual number of patients seen in each asthma severity could increase or decrease these estimates. Lastly, we only analyzed billing capability through the efforts of this project; we did not assess revenue generation, which is dependent on different contracts with payors. The project's impact was more significant for charge-based fee-for-service reimbursement models, which comprise the majority of current contracts.

CONCLUDING SUMMARY

This project shows that an asthma-specific note template designed with the help of a hospital coding team can lead to optimized billing by encouraging more thorough documentation and more standardized billing. Improved billing through note templates, especially disease-specific

templates, is an area with significant opportunity for ongoing, innovative, quality improvement projects and research.

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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