Utility of a Clinical Pathway Designed to Triage and Reduce Perioperative Risks for Children with Sleep Disordered Breathing Undergoing Adenotonsillectomy

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Abstract

OBJECTIVES: To determine if a clinical pathway for children with Sleep Disordered Breathing (SDB) undergoing adenotonsillectomy (T&A) impacts careproviders' decisions to triage patients.
PROJECT GOALS: A pathway was designed and published on the at Children's Hospital of Philadelphia (CHOP) website by experts in otolaryngology, sleep medicine, critical care medicine, anesthesia, nursing, web development and bioinformatics. (Figure 1) Effectiveness and utility of the pathway was then evaluated by 1) Surveying clinicians to determine if measured reductions in variation and improvement in practice were associated with the availability of the published clinical pathway and 2) Convening a hospital based team from the Office of Clinical Quality Improvement (OCQI) to evaluate "surgical throughput" of patients from initial planning stage to final destination utilizing the pathway as a model for best evidence triage practice.

Introduction

Variation exists in protocols used to determine where children with SDB undergoing T&A should be triaged after surgery including 1) whether the surgery should be performed at an ambulatory surgical center (ASC) or in a hospital and 2) where the child should be disposed postoperatively (home, hospital ward or to pediatric intensive care unit (PICU)). Guidelines from the American Academy Otolaryngology Head and Neck Society (AAO-HNS, 2011) and American Academy of Pediatrics (AAP, 2012) published similar recommendations to prevent respiratory and other complications based on certain risk factors, but variation in practice continues to exist in North America.[1,2] Prospective studies suggest that gas exchange anomalies (O_2 nadir < 85% and CO_2 peak > 60%) are more predictive of negative outcomes than the more frequently cited Apnea Hypopnea Index (AHI).[3] (Figure 2) The purpose of this project was to determine whether availability of a clinical triage pathway based on guideline, local expert opinion and these prospective data reduced variation in triage practice within a large tertiary pediatric hospital.

Methods and Materials

1) Survey of CHOP otolaryngology physicians and nurse practitioners responsible for the initial triage plan for children undergoing T&A for SDB to determine if improvement in triage protocols resulted from publication of a clinical pathway.
2) Analysis of surgical throughput of these children by a Quality Improvement and Data Analysis team utilizing EHR data to determine accuracy of triage plan based on the clinical pathway. Data were collected from EPIC, polysomnography data base and from the Anesthesia Resource Center (ARC) screening records. The ARC evaluates all surgical candidates undergoing surgery at CHOP.
3) A Qlikview application was then developed from collected data.

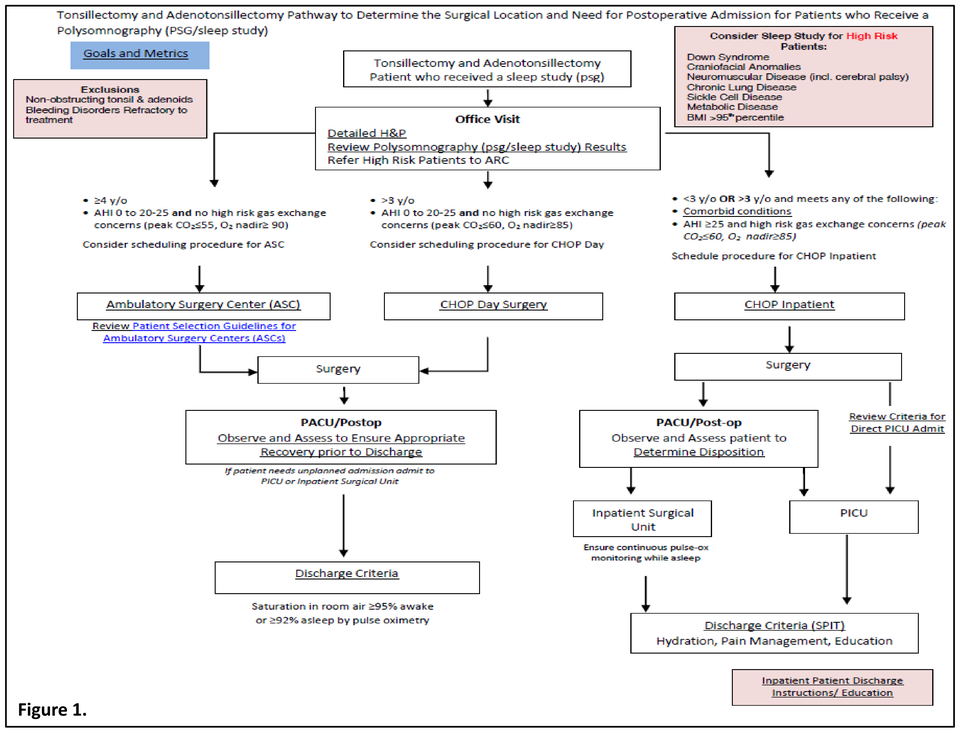

Figure 1.

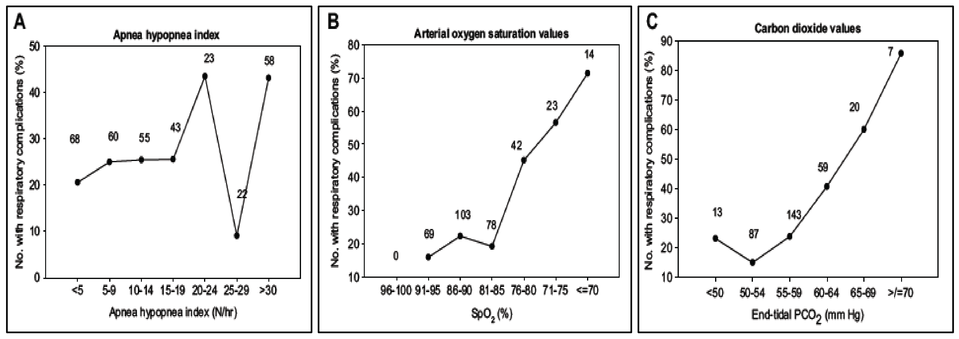

Figure 2.

Results

Baseline data collected: 2,320 adenotonsillectomies were performed between 7/1/13-8/1/14. Over the first year the pathway was utilized, admissions to PICU dropped by 44%(154 patients in 2014 (99 scheduled/55 unscheduled) to 86 patients in 2015 (56 scheduled/30 unscheduled). The frequency of unexpected transfers of patients from ASC's to the main hospital or from regular ward to critical care ward did not change. Nine out of twelve (75%) surgeons and 18/27 (67%) nurse practitioners responsible for preoperative determination of surgery site and which level of care would be required postoperatively were surveyed. Only 20/36 (56%) clinicians were aware of the pathway and 2/20 (10%) routinely used it to triage patients.

In a separate analysis performed by OCQI from 7/1/2015 - 6/30/2016, 2,580 T&As were performed within the CHOP system (979 at Ambulatory Care Centers and 1,601 at CHOP Main Hospital). Of those patients who had surgery performed at Main, comparisons of initial plan to final destinations were made and deviations from recommended protocols based on the clinical triage pathway evaluated. 1,358 (85%) patients were screened appropriately according to pathway, and of the 243 patients (15%) who were not, it was more like that the acuity of planned care needed was lower than anticipated. Specifically, changes in planned disposition were as follows: 165 (68%) patients who had been scheduled to be admitted to the hospital ward went home directly from the recovery room (95 patients) or were downgraded from a scheduled PICU stay to a regular ward stay (70 patients) and 78 (32%) patients who had been scheduled to go home were admitted to a regular ward.

Discussion

Clinical practice guidelines have been noted to vary in effectiveness in changing patterns of practice. Based on surveys, our clinical pathway developed to standardize perioperative triage appeared to have been underutilized. However, in evaluating outcomes derived from another CQI project that allowed for comparisons of data bases, our clinical pathway had been incorporated into different levels of anesthesia screening and was utilized more effectively than anticipated. When analyzing themes in observed discrepancies between ideal triage scenarios (following the pathway) and actual final triage destination, deviations tended to relate to the following patterns:

1) For those more likely to have needed increased level of care to overnight observation or ICU, the initial ENT provider appeared to have underestimated presence of comorbid conditions (especially extreme obesity) or the child had an unanticipated event in the post-anesthesia care unit (PACU) such as obstruction, vomiting or drowsiness.

2) For those who were more likely to have decrease in level of care, the child was more likely to have borderline indications for admission (based on PSG scores or age in the range of 3- 3½ years) but had done well enough in the PACU to warrant discharge to home.

Conclusions

The effectiveness of this clinical pathway relates to its presence on the hospital intranet, making it available at multiple levels by all clinicians. It appears to be a valuable tool in managing bed capacity and perioperative outcomes following adenotonsillectomy.

References

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