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Improving nursing adherence to pediatric pain management bundle using the PDSA cycle

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Improving Nursing Adherence to Pediatric Pain Management Bundle using the PDSA
Cycle

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Dedication Page

This project is dedicated to my wife Susan and my family for their love, support, and encouragement through this amazing journey.

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Abstract

Given the current standards, pediatric post-operative pain management can be a distressing outcome to the patient and family. Adequate management of post-op pain in this population is a challenge despite the availability of evidence-based interventions combined to form care bundles. Tonsillectomies are common procedures in the pediatric population and often include moderate to severe pain with ineffective pain relief. Inadequate pain management leads to unplanned admissions, longer post anesthesia care unit (PACU) stays, slower oral intake, and longer recovery periods. In this project, two interventions were tested using the plan-do-study-act (PDSA) model for rapid cycle improvements. The first intervention was to improve the nurse's knowledge of the pain management bundle. The second intervention was the modification of workflows to enhance the delivery of education to the patient and family. The objectives of this project were to increase nursing knowledge on evidence-based pain management bundles, reduce post-operative provider encounters for pain related complaints, improve the implementation of evidence-based practice pain management bundles, and standardize successful practice interventions.

Key words: pediatric, PDSA, rapid cycle improvement, evidence-based care, post-operative, procedure, pain management, tonsillectomy, pharmacologic, and non-pharmacologic.

Introduction and Background

Over the last year, a Southwest Virginia academic medical center opened a pediatric post anesthesia care unit to provide a child safe and friendly environment that promotes family centered care while providing all phases of post anesthesia care. During the evolution of this model, the utilization of evidence-based care practices was implemented to manage the patient's post-operative pain better. Despite the evidence that guides nursing to manage pediatric patient's pain, families continue to have provider contact through office phone calls, office visits, and emergency room visits for pain related symptoms. Preliminary data at this southwest Virginia hospital found that the evidence-based standards are not consistently followed. Further review has revealed that nurses need a better understanding of the evidence, the expectations of care delivery, and tools to assist them in improving adherence to the evidence-based standards. A quality improvement project using plan-do-study-act (PDSA) cycles was initiated to allow small tests of change to be implemented and evaluated. To analyze the evidence-based standards for pediatric pain management, the tonsillectomy pediatric population was chosen.

Tonsillectomy is a common procedure performed in hospitals around the country. There are approximately 250,000 tonsillectomies performed each year in the pediatric population, with most patients under the age of 15 years (Howard et al., 2014). In most pediatric tonsillectomy cases, patients frequently go home the same day. This quick turnaround can lead to inadequate pain control. Pain after a tonsillectomy is a priority consideration, is often intense lasting anywhere from one week to ten days, and is often rated as medium to high intensity (Howard et al., 2014). Pain management is an essential

component of the postoperative plan of care and is one of the more difficult tasks to accomplish (Scalford et al., 2013). Despite the difficulty in managing pediatric post-operative pain, this task is one that should not be ignored or overlooked. Studies in Europe and Asia have shown that providers often under manage post-operative pain, despite pediatric pain management being a focus of nursing research over the last decade (Scalford et al., 2013). A review of the literature shows three essential components in managing post-operative pain, including pediatric patient education, pharmacological, and non-pharmacological interventions (Howard et al., 2014). Developing an adequate process for understanding how these essentials are being followed and utilized clinically is crucial to the successful management of post-operative tonsillectomy pain.

Problem Statement

Pediatric patients presenting for a tonsillectomy procedure are at risk for ineffective pain management through the recovery period. In 2015, there were over one hundred pediatric patients that had a tonsillectomy procedure at the established clinical site. Forty-two percent of these pediatric patients had an encounter with a provider related to pain between day one and day ten of the recovery period. Despite the evidence, nursing staff do not consistently implement the full pain management bundle. The lack of consistency in providing these essential interventions contributes to inadequate pain management and subsequent provider contacts.

Objectives and Aims

The aim of this project was to implement small tests of change using the PDSA cycle, to remove barriers and obstacles that impede the nursing staff's ability to consistently provide evidence-based pain management care. The objectives of this

project were to increase nursing knowledge of evidence-based pain management bundles, reduce post-operative provider encounters for pain related complaints, improve the implementation of evidence-based practice pain management bundles, and standardize successful practice interventions.

Review of Literature

A literature review was conducted following the preferred reporting items for systematic reviews and meta-analysis (PRISMA) guidelines for reporting in systematic reviews (Moher, Liberati, Tetzlaff, & Altman, 2009). Key words utilized during the search included: pediatric, post-operative, procedure, pain management, tonsillectomy, pharmacologic, and non-pharmacologic. Cochrane databases were the first databases utilized during the search. Additional databases available and utilized were CINAHL, MEDLINE, Nursing & Allied Health Collection: Comprehensive, MasterFILE Premier, SPORTdiscus with full text, and science direct. Filters applied to narrow the search to included peer reviewed journals published between 2004 and 2015. Further filtering occurred through the review of terms in the title and abstract, available in English, addressed pain management after a tonsillectomy or needle procedure, and was specific to the pediatric population. A total of 10 studies were extracted and included in this literature review.

Cochrane database searches were conducted at the start. A total of 145 articles were returned and filtered by pain and anesthesia to a total of 5 articles. From the 5 articles, 4 were removed due to their content being primarily around procedure methodology. The final article was excluded based on the content being focused on a

specific medication pre-operatively and data collection on general procedures experienced by pediatric patients.

The additional databases available through the James Madison University library research tools returned 82 articles. The 82 articles were reviewed and narrowed to 19 eligible articles. Nine of these studies were removed due to the inability to review full text and those that did not meet inclusion criteria. The result was 10 articles that were appropriate for this review. The 10 studies included in this review were further analyzed and placed within a matrix table. The level of evidence was assessed and documented with each study using the Oxford Centre for Evidence-Based Medicine (Oxford Levels of Evidence Working Group, 2011) and the main conclusions of the article. The following sections will synthesize the literature to define pain and further describe the components of the evidence-based practice care bundles.

Pain

Pain as defined by the International Association for the Study of Pain (IASP) is the “undesirable sensory, emotional and cognitive experience associated with damage to tissue” (IASP, 2012, para. 1). Vaajoki (2013) further explains how pain is a complex process that is unique, subjective, and multidimensional; directly impacted by gender, age, previous experiences with pain, and emotional factors. Pain can be classified as acute or chronic and can be experienced by the patient even after tissue healing is complete. Pain may further be classified by its cause. Nociceptive pain is a result of tissue damage and is most frequently localized to the area of damage (Cox, 2010). Tonsillectomy pain can be defined as acute, nociceptive pain that is described as sharp, stabbing pain, most often experience with swallowing (Cox, 2010).

Evidence-Based Practice: Care Bundles

Evidence-based practice is a methodology utilized by healthcare providers to use evidence that has been critically appraised and scientifically supported to guide nurses in providing high quality care to specific populations (Majid, et al., 2011). In the early part of 2001, the Institute for Healthcare Improvement (IHI) developed care bundles. Care bundles are a set of evidence-based practices or interventions, targeted at a specific population, in a specific setting, that when implemented together provide improved outcomes for the patient (Resar, Griffin, Haraden, Nolan, 2012).

According to Resar (2012), care bundles are designed using three to five interventions and each element is relatively independent. The purpose of a bundled approach is to combine a small selection of interventions and treatments that have already been established, generally accepted, and published in national guidelines. Compliance with bundles should be measured using an all-or-none approach, with a goal of 95% overall compliance (Resar, et al., 2012). Pain management in the pediatric post-operative population can be combined in an evidence-based bundle, to improve the pediatric patient's experience with pain. Current methodologies are surgeon and anesthesia provider dependent, focused primarily around pharmacological methodologies in the immediate post-operative phase.

Surgical Pediatric Patient Education

The preparation of pediatric surgical patients and their families is a psychological need identified more than 30 years ago. Studies have shown that education is best received when performed as a collaborative approach by the RN and CLS (Howard, et al, 2014). Education is an essential component in decreasing the anxiety of pediatric

patients and their family. The results of a study by Soleymanifard, Khademolhoseyni, and Nouri (2015), indicate that surgery anxiety may be a contributor that influences pain intensity, and this anxiety can be absorbed by the pediatric patient from the parents.

Written information, face-to-face communication, and on-going education through the peri-operative process are essential in reducing anxiety. Providing the family unit with education on assessing, managing, and expectations of post-operative pain is essential for optimal outcomes. Families often feel that the information they are provided does not prepare them for what to expect immediately after surgery, or when they arrive at home.

Day surgery is common practice for tonsillectomy procedures, and educating the family pre-operatively is essential. Education should include the parent and the patient (age appropriate) and validate understanding on what to expect during recovery, how to monitor and treat the patients pain, and what signs and symptoms need to be called to the provider. Thorough education sets the stage for the post-operative course to successful recovery. In a study by Klemetti et al (2009), patients who were involved in an interactive preoperative teaching program had decreased pain and required less analgesics post operatively. The preoperative teaching program provided parents with information on structured preoperative intake prior to fasting. Adequate fluid intake has been shown to improve post-operative pain scores. Additional studies support the need for nurses to receive education on how to use and promote non-pharmacological pain relief methods such as cognitive-behavioral, physical support, emotional support, assisting with daily living activities, and providing a healing environment (He et al., 2010).

Pharmacological

Opioid use is a common practice immediately post-operative to alleviate mild to severe pain. The use of opioid analgesics has proven to be effective in managing mild to severe pain, however, this often leads to an increased PACU stay for observation (Hadden, Burke, Skotcher, & Voepel-Lewis, 2011). Opioid use has also been tested to see how often it should be administered. In a study by Sutters et al. (2010) the aim was to determine the efficacy of opioids provided as needed (PRN) or around the clock (ATC) administration at timed intervals. The study found that ATC administration of acetaminophen and hydrocodone was effective in adequately managing post-operative pain, specifically in the first 48 hours.

Additional methodologies related to pharmacological intervention have shown to be effective in addition to single opioids. Some of the suggested methods include combination opioids, opioids and acetaminophen, and nonsteroidal anti-inflammatory drugs. The non-opioid drugs may be used as solo agents and provide adequate pain relief (Smith et al., 2009). Chou et al. (2009) provide recommendations for pediatric pain management care. Every pediatric patient is unique and should be individually assessed based on developmental age, medical and psychological co-morbidities, and social history. Plans of care should be flexible to meet the pain management needs, and improve recovery outcomes (Chou et al, 2009).

Non-Pharmacological

Non-pharmacological interventions have been found to be effective in managing post-operative pain as a standalone intervention or in combination with pharmacological treatments. Children report useful techniques that include consumption of soft and/or cold foods, increased fluid intake, decreased talking, ice packs, parental comfort,

distraction, rest, and positioning (Howard et al., 2014). Complementary therapy comes in multiple forms and includes behavioral therapies, local treatments, and acupuncture.

While these have demonstrated effects in small numbers, the author could not recommend specific therapies for practice (Fayoux & Wood, 2014).

Ice-lollies are a newer method of pain control that has shown success in the pediatric population. Ice-lollies work on the premise of cryotherapy, where the cold from the lollies reduces metabolism and controls the inflammation, thereby the pediatric patient experiences less pain (Sylvester, Rafferty, Bew, & Knight, 2011). Children who have undergone tonsillectomy versus other head and neck surgeries have reported substantial effectiveness in reducing post-operative pain compared to analgesics. Additional benefits of this non-pharmacological method is the intervention of ice-lollies to promote early intake of food and drink, which has shown to reduce the perception of post-operative pain, decreased nausea and vomiting, and improved mood of the pediatric patient (Sylvester, et al, 2011).

Theoretical Model

This project utilized the Institute for Healthcare Improvement's model for improvement and the plan-do-study-act (PDSA) cycle tool to improve implementation of evidence-based care in the pediatric PACU. The model for improvement (Appendix A) is effective in guiding quality improvement changes utilizing the PDSA cycle tool (Donnelly & Kirk, 2015). The core improvement of quality is aimed at safety, efficiency, patient centeredness, timeliness, effectiveness, and equity. The PDSA cycle is a standard tool for learning and change management (Donnelly & Kirk, 2015).

In the plan phase, organizations recruit a team, draft an aims statement, describe current processes, describe the current problem, and identify causes and alternatives (PDSA, 2015). In this project, a team was formed and reviewed the current processes and proposed solutions to overcoming barriers to implementing evidence-based practice.

In the do phase, the team implemented the action plan and collected data (PDSA, 2015). Small tests of change were implemented and monitored for outcomes. Data collection included successes, unintended effects, and general observations that are important to the third phase of the PDSA cycle.

In the study phase, the team completed the data analysis, reviewed results and paired the results of the outcomes to the expected outcomes (PDSA, 2015). This phase also included a summary of what the team learned and what adjustments needed to be made to achieve success.

The final phase consisted of the act phase where the team reflected on the plan and outcomes. If the desired outcome is achieved, then the intervention is standardized. If the team believed that the intervention did not achieve the desired outcome, then the cycle begins again in the planning phase with a new intervention (PDSA, 2015).

Project Study and Design

This project was a quality improvement project, that used rapid cycle change theory to test two elements (small tests of change) aimed at improving workflows and knowledge to increase adherence to the pediatric pain management bundle. Using the PDSA cycle, the sample sizes can be smaller and provide statistically significant results.

The pediatric nursing team cycled each change over a two-week period and then monitored the outcomes for two additional weeks. The pain duration in most pediatric tonsillectomy patients is from 7-10 days (Howard et al., 2014). A two-week monitoring period, provided sufficient time to perform chart reviews and document the adherence to the pain management bundle, and any post-operative contacts made with providers related to pain.

In the first cycle education was provided on the evidence-based care bundle, the current compliance with the bundle, and established the goal of 95% compliance. Education was performed in a live format. A debriefing session occurred after the education to answer any questions and provide clarification on the project. Once the education was complete, the PDSA cycle 1 began the following Monday.

The second cycle began approximately four weeks after the start of the first cycle. The second cycle was a printed educational brochure for the parents to review prior to discharge (Appendix B). Previously, accessing the instructions in the electronic medical record (EMR) database disrupted the nursing workflow. The nurse is required to enter the EMR, make several clicks, enter a search, and print the documentation in conjunction with the after-visit summary. Readily available printed materials on the unit provided opportunities for nurses to quickly access and review the printed material with the parents. In conjunction with the discharge materials, the pediatric patient's family member was provided with an Apple iPad to view a four-minute video on the tonsillectomy procedure and aftercare.

Settings and Resources

The setting for this project was an academic level I trauma center in southwest Virginia. The projects clinical site has 703 licensed beds plus a 60-bed neonatal intensive care unit and is the region's only Level I Trauma Center. The post anesthesia care unit (PACU) is located adjacent to 25 main operating rooms and is divided into pediatrics and adults, separated by location. The main PACU has 18 recovery beds, and the pediatric PACU has 7 recovery beds. Combined, the two units are staffed with 42 registered nurses (RN's). Eight of these nurses are primarily assigned to pediatric recovery, report to a pediatric recovery clinical team leader and a masters prepared unit director.

The project location has five highly trained pediatric anesthesiologists, two pediatric otolaryngologists, three pediatric general surgeons, one high functioning pediatric surgical nurse practitioner, one pain management clinical nurse specialist, and one surgical child life specialist. Commitment from this set of resources was obtained for this project.

Study Population

Tonsillectomies are frequent ambulatory surgeries that cause high levels of pain that continues 7-10 days post operatively (Dorkham et al., 2014). The study population for this project was pediatric patients that are 17 years of age or younger. Pediatric patients included in this project had an elective tonsillectomy, received care in the pediatric post-anesthesia care unit (PACU), and were discharged home.

Sources of Data

Data gathering for this study included surgical log queries using the electronic medical record (EMR) on the selected date ranges and filtered to provide the log numbers

for all pediatric patients who met the selected criteria. The logs were reviewed to verify that the pediatric patient met the criteria for inclusion: date, age, procedure, and case class. Further data (Appendix C) that were collected consists of:

Age. The patient's age was operationalized as the age at the time of the procedure to document that the patient meets the project criteria set forth for this project between the ages of 0 and 17.

Pain Scale and Level. Patients pain was rated using validated tools to include the numbers, revised face, legs, arms, cry, consolability (rFLACC), neonatal pain and agitation sedation score (N-PASS), and the Richmond Agitation and Sedation Scale (RASS). The pain scale that was chosen is based on the individual nurse, the age of the patient, and the patient's sedation level. In this project the data presented showed the pain ratings at arrival in PACU, after a pain management intervention, and on discharge.

Intervention. Pharmacological, non-pharmacological and educational interventions were reviewed and documented. Evidence-based care bundles are all-or-nothing documentation. Documenting a 1 indicated that all three interventions were performed, documenting a 2 indicated that one or more interventions had not been utilized or documented.

Education. The patient's chart was reviewed for pre-operative education during their pre-surgical testing visit. Documentation compliance is based on documenting education on the tonsillectomy procedure, the normal course of recovery, and when to call the physician.

Linking the Data. The first goal of this project was to improve post-operative pain management of pediatric patients undergoing tonsillectomy procedures. We had

identified that forty-two percent of the pediatric patients had high intensity pain from day zero to day ten, and had an encounter with the provider that is related to signs and symptoms of a normal course of recovery. Data collection helped to provide the principle investigator with a picture of how patients are being managed in the PACU and if the parents are being educated on how to assess and manage their child's pain.

Data Analysis. Data analysis occurred during the study phase of the PDSA cycle. Data were entered into Statistical Package for the Social Sciences (SPSS) version 24 and was analyzed using the paired t-test comparing observations from the pre and post intervention. The post implementation data were hypothesized to be higher than the pre-scores for provider compliance utilizing the pediatric post-tonsillectomy pain management bundle technique.

Findings

A paired-samples t-test was performed to compare nurse's compliance to the pain management bundle before and after project interventions. There was a significant difference in compliance between the pre ($M = 0.44$, $SD = 0.500$) and post ($M = 0.71$, $SD = 0.458$) project interventions (Table 1); $t(61) = -3.168$, $p = .002$. These results suggest that education and workflow changes improve nursing adherence to the pain management bundle (Table 2).

Sixty-two charts were included in this project from the pre-intervention and 62 charts from the post intervention time periods. The median age in both groups was six, with an average pain rating of one on admission to the PACU. As patients began to emerge from anesthesia, pain ratings slightly increased until a pain management intervention was provided. After a pain management intervention was provided, the

average pain rating was zero and continued to be zero at the time of discharge. The number of post-operative provider encounters related to pain decreased from 42% to 17%, a total reduction of 25% that can be attributed to pain management bundle compliance.

Table 1: Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-Intervention	.44	62	.500	.063
	Post-Intervention	.71	62	.458	.058

Table 2: Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-Intervention – Post-Intervention	-.274	.682	.087	-.447	-.101	-3.168	61	.002

Recommendations/Implications

Pain after a tonsillectomy is a priority consideration and is described as medium to high intensity (Howard et al., 2014). Despite this knowledge, nurses have had difficulty in adhering to an evidence-based care bundle. This quality improvement project was successful at enhancing knowledge, implementing small tests of change using

the PDSA cycle, and removing barriers and obstacles that impeded the nursing staff's ability to consistently provide evidence-based pain management care.

A high number of pediatric patient's experience undertreated post-operative pain after having a tonsillectomy. Pediatric patients are highly susceptible to long term complications, specifically health seeking behaviors (Kolcaba, 2006). As a child ages into an adult, the need exists to seek preventative and screening care. The lack of health seeking behaviors as children grow into adults leads to increased morbidity and mortality.

Evidence-based care bundles were instituted in the early 2000's and provided organizations with a set of interventions that ultimately lead to better quality of care and outcomes. Despite strong evidence in the literature, workflows and processes limit the nurse's ability to engage fully in delivering evidence-based care. The use of PDSA cycles allows the team of providers to improve these work processes and workflows through small tests of change.

The strengths of this project are the ability to utilize small samples, gain statistical strength using PDSA cycles. Pain management is one of the highest priorities for the post-operative team, and the use of evidence-based care bundles provides a framework for practice. Staff were highly engaged in the project and improving pain management for the pediatric population. Standardized approaches permit the project to be replicated in different facilities over time with the production of comparable findings.

Project weaknesses are directly related to the limits of the organization and the department in carrying out the PDSA cycles. The project interventions are specific to the workflow, needs of a specific unit within the hospital, and are limited to one facility and age group. Educational materials and videos were created using lay and generalized

terminology, and is not tailored to the individual learner. Family units had difficulty engaging in the use of the Apple iPad education. The timing of providing the technology to the parents needs to occur while the patient is intra-operative. Staff found that the family units were more focused on the pediatric patient instead of the content of the video.

This quality improvement project identified opportunities for future study and opportunities for workflow changes. During this project, a major upgrade to the EMR occurred, and many flowsheets were changed or retired. These changes provided increased challenges for finding charted data in consistent locations, and posed additional workflow challenges for the nurses. Documentation flow is an opportunity for future studies; focusing on how data are placed in a chart enhances or inhibits documentation compliance.

One additional recommendation is to study the variability in practice over time after education has been provided on pain management. Additional studies are essential to determine what intervals education and refreshers need to occur to maintain compliance to evidence-based practice standards.

Results of this project will be distributed in various settings and formats, including locally, organizationally, and nationally. Expanding the scope to include patients beyond the tonsillectomy patient is essential, and will include additional services. These services include pediatric general and orthopedic surgery. Further dissemination will occur through integrated councils and committees, promoting the project work to the regional hospitals within the organization. On a national level, a manuscript is under development targeting the perianesthesia audience.

Conclusion

Pain management is a complex process that engages the healthcare team with the family unit to manage a pediatric patients pain. Nursing knowledge and impaired workflows were barriers to effective pain management. The use of the PDSA cycle to improve nursing workflow creates an opportunity to provide input and feedback on how to improve nurse's ability to provide high quality care. Utilization of the PDSA model to identify barriers to success, implementing small tests of change, and evaluating the outcomes proved successful, realizing a 25% decrease in family initiated provider contacts. Adherence to evidence-based bundles implemented in this project have shown enhanced knowledge, decreased post-operative provider encounters, and standardized successful practice interventions.

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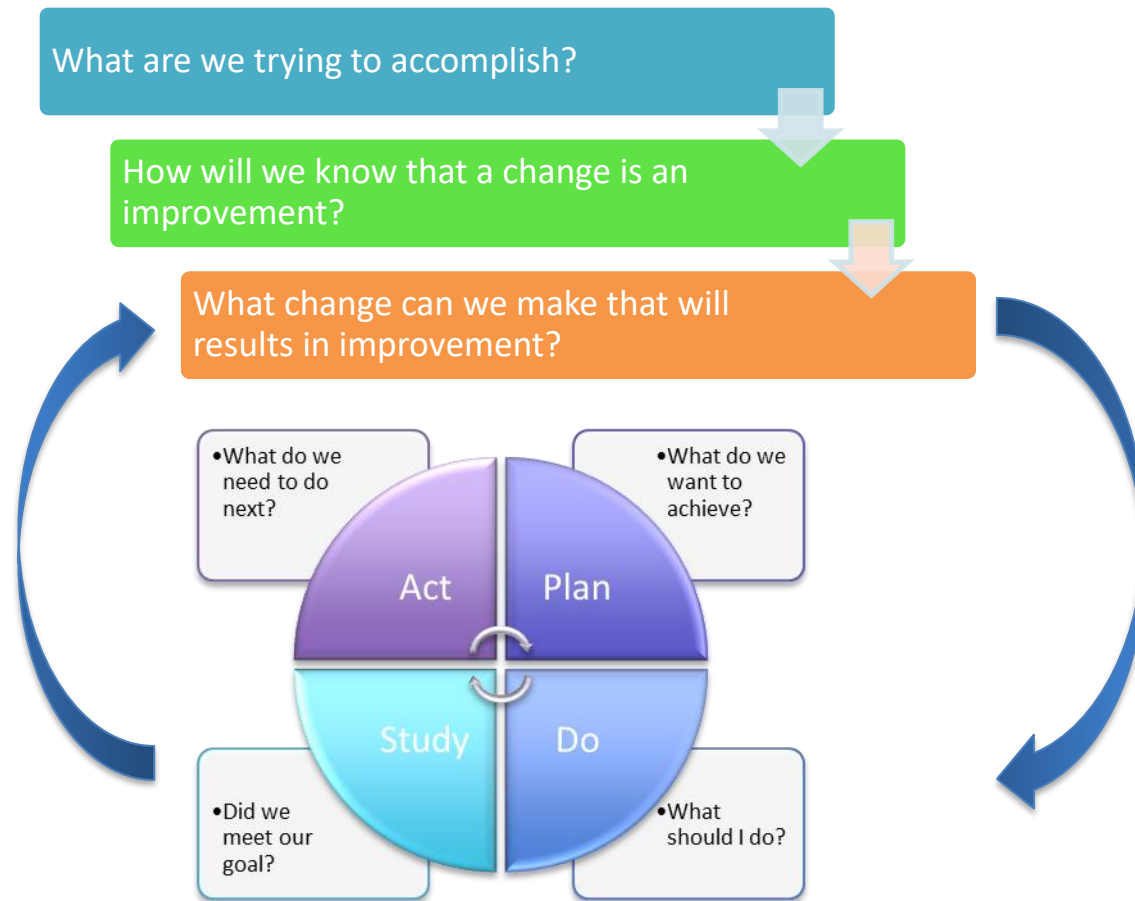
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Appendix A

Figure 1: Institute for Healthcare Improvement Model for Improvement with PDSA Cycle Tool



Adapted from the Institute for Healthcare Improvement (2017)

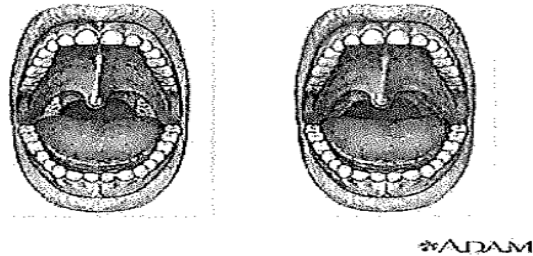
Appendix B

Tonsillectomy Post-Operative Instructions

Tonsillectomy in Children

WHAT YOU SHOULD KNOW:

A tonsillectomy is surgery to remove your child's tonsils. Tonsils are 2 large lumps of tissue in the back of your child's throat. Adenoids are small lumps of tissue on top of the throat. Tonsils and adenoids both fight infection. Your child may need his tonsils removed to improve breathing and asthma, and to reduce throat, sinus, and ear infections. His adenoids may be taken out at the same time if they are large or infected.



AFTER YOU LEAVE:

Medicines:

- **NSAIDs** help decrease swelling and pain or fever. This medicine is available with or without a doctor's order. NSAIDs can cause stomach bleeding or kidney problems in certain people. If your child takes blood thinner medicine, **always** ask if NSAIDs are safe for him. Always read the medicine label and follow directions. **Do not give these medicines to children under 6 months of age without direction from your child's doctor.**
- **Acetaminophen:** This medicine decreases pain and fever. You can buy acetaminophen without a doctor's order. Ask how much and how often to give it to your child. Follow directions. Acetaminophen can cause liver damage if not taken correctly.
- **Pain medicine:** Your child may be given a prescription medicine to decrease pain. Do not wait until the pain is severe before you give him more pain medicine.
- **Antibiotics:** This medicine is used to help prevent or fight an infection caused by bacteria. Give this to your child as directed.
- **Give your child's medicine as directed:** Call your child's primary healthcare provider if you think the medicine is not working as expected. Tell him if your child is allergic to any medicine. Keep a current list of the medicines, vitamins, and herbs your child takes. Include the amounts, and when, how, and why they are taken. Bring the list or the medicines in their containers to follow-up visits. Carry your child's medicine list with you in case of an emergency. Throw away old medicine lists.
- **Do not give aspirin to children under 18 years of age:** Your child could develop Reye syndrome if he takes aspirin. Reye syndrome can cause life-threatening brain and liver damage. Check your child's medicine labels for aspirin, salicylates, or oil of wintergreen.

Follow up with your child's primary healthcare provider as directed: Write down your questions so you remember to ask them during your child's visits.

What to expect after surgery:

- **Pain and swelling:** Your child's face, throat, and neck may be swollen or tender for up to 2 weeks after surgery. His pain may be worse in the morning.
- **Mild fever:** Your child may have a low fever while the tonsil areas heal. Give him liquids often to help reduce it.
- **Bleeding:** A small amount of bleeding is normal within 24 hours after surgery. Bleeding can also happen 5 to 10 days after surgery when the scabs fall off, or he has an infection. Ask how much bleeding to expect.

Mouth care: It is normal for your child to have throat pain and bad breath after surgery. Help your child with the following:

- Gently rinse his mouth as directed to remove blood and mucus.
- Help him gently brush his teeth. Do not let him gargle or brush his teeth too hard. This can cause bleeding.

Food and drink: Your child will need a liquid diet or soft food diet for several days after surgery.

- **Give your child plenty of liquids:** This will help prevent fluid loss, keep his temperature down, decrease his pain, and speed his healing. Liquids and foods that are cool or cold, such as water, apple or grape juice, popsicles, and gelatin, will help decrease pain and swelling. Do not give him orange juice or grapefruit juice. These may bother your child's throat.
- **Give your child soft foods:** Do this once he can drink liquids easily and his stomach is not upset. Examples are applesauce, oatmeal, soft-boiled eggs, macaroni, and ice cream. Once he can eat soft food easily, he may slowly begin to eat solid foods. Do not give him anything spicy, hot, or with sharp edges, such as chips. These can hurt his tonsil areas.
- **Do not give your child hot foods or drinks:** Do not give your child hot tea, soup, or any other hot or warm foods or drinks. They can increase his risk for bleeding. Do not give your child milk and dairy foods if he has problems with thick mucus in his throat. This can cause him to cough, which could hurt his surgery areas.

Care for your child after surgery:

- **Let your child rest:** Your child will need to rest and limit his activity for 7 to 10 days after surgery or as directed.
- **Use ice on your child's throat:** Ice helps decrease swelling and pain. Use an ice pack or put crushed ice in a plastic bag. Cover the ice pack with a towel and place it on your child's throat for 15 to 20 minutes every hour for 2 days.
- **Use a cool humidifier:** This will help moisten the air and soothe your child's throat.
- **Gently wash your child's neck:** Bathe your child as you normally would, or have him bathe himself with care. His throat and neck may be sore. Ask if you need to use cool water to wash his neck until it heals.
- **Do not smoke around your child:** Keep him away from smoky areas. Smoke may cause his throat to bleed.
- **Keep your child away from people with colds, sore throats, or the flu:** He may get sick more easily after surgery.

Contact your child's surgeon or primary healthcare provider if:

- Your child has a fever.
- Your child has throat pain or an earache that is worse than expected.
- Your child has pus or blood draining down his throat.
- Your child has itchy skin or a rash.
- You have any questions or concerns about your child's care.

Seek care immediately or call 911 if:

- Your child has bright red bleeding from his throat, nose, or mouth, or his bleeding worsens.

- Your child feels weak, dizzy, or like he will faint when he sits up or stands.
- Your child has severe throat pain with drooling or voice changes.
- Your child has a stiff and painful neck.
- Your child has sudden swelling or pain in his face or neck.
- Your child has back or chest pain.
- Your child has trouble breathing or swallowing.

Appendix C

Data Collection Table

Variable Name	Brief Description	Data Source	Possible Range of Values
Patient Identification	10SL16	EMR	N/A
Age	On date of procedure	EMR	0-17
Pain Scale Utilized	Pain Scale	EMR	1=Numeric 2=rFLACC 3=N-PASS 4=RASS 5=other
Pain level	Rating/ Assessment	EMR	0-10
Intervention	Bundle utilized	EMR	1=Yes-all three components utilized 2=No-one or more components not utilized
Follow Up	Did the patient have provider contact in the 10 days after surgery related to pain?	EMR	1=Yes 0=No