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Educational Prevention Program of Surgical Site Infections at a Metropolitan Pediatric Hospital

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Running Head: EDUCATIONAL PREVENTION PROGRAM OF SURGICAL SITE

INFECTIONS AT A METROPOLITAN PEDIATRIC HOSPITAL

Educational Prevention Program of Surgical Site Infections at a Metropolitan Pediatric Hospital

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Abstract

Surgical site infections (SSI) are a common cause of healthcare-associated infections (HAI). They remain a significant problem, as they are associated with increased morbidity and mortality and cause an increase in demand for several healthcare resources. In order to address this problem, hospitals have implemented several protocols and policies that are aimed to reduce these infections. However, the rates of SSIs continue to rise. Healthcare team members have found that while it is their responsibility to enforce preventative measures to the patient in the preoperative and surgical room, patient compliance to preventive measures at home also plays a role.

At a pediatric metropolitan hospital, a group of CNL students conducted a quality improvement project that focuses on the implementation of an educational pamphlet for preoperative patients. The purpose of this pamphlet was to educate preoperative patients on proper hygiene methods that can reduce surgical site infections. A SSI Prevention Assessment Tool was created in order to survey the amount of preoperative patients who were clean and dirty. Results from these surveys indicated that majority of the preoperative patients were found to be clean. The CNL students were unable to collect and analyze data from the implementation of the educational pamphlet as it still under review from the Patient and Family Education Committee. However, results from the SSI Prevention Assessment Tool surveys indicate that patient education is needed. The CNL students believe that the implementation of *Preventing Surgical Site Infections at Home* will decrease rates of SSIs.

Statement of the Problem

A SSI is an infection that occurs in the wound after a surgical procedure is performed (Centers for Disease Control and Prevention[CDC], 2018). SSIs can be localized to the incision site, or can also extend into deep tissues. Studies have found that SSIs have been one of the most common types of healthcare-associated infections, accounting for 31% among hospitalized patients (Centers for Disease Control and Prevention, 2018b). In the United States, there are approximately 160,000 to 300,000 SSIs annually, and estimated costs include \$3.5 to \$10 billion annually (Science Daily, 2017). SSIs are associated with increased morbidity and mortality, increased length of stay (LOS), and increased health care costs. Since bacteria found on the skin frequently cause SSIs, standard preventative practices have been implemented. While it is the responsibility of the healthcare team to educate their patient about these practices, compliance is ultimately up to the patient.

At a large metropolitan hospital, there has been an increased rate of SSIs in preoperative pediatric patients. The most common bacteria found in these infections have been *Pseudomonas aeruginosa*. *Pseudomonas aeruginosa* infections are caused by strains of bacteria that are found widely in the environment (Centers for Disease Control and Prevention, 2018a). This bacterium can easily be spread through the hands of a healthcare worker or a surgical instrument that is contaminated or is not properly cleaned. In order to prevent this infection, careful attention must be given to routine infection control practices. Hand hygiene and environmental cleaning can substantially lower the risk of infection.

At this hospital, surgical patients are provided with preoperative packets that contain information regarding basic preparation for the day of the surgery. This includes information regarding eating and drinking rules, what clothing to pack, and infection prevention methods.

While it does state that showering and hygiene are an important part in preparation, there is no specific method of how to be considered clean. The purpose of this project is to educate patients on proper hygiene practices prior to surgery in order to reduce surgical site infections. This will be done by creating an educational pamphlet that discusses what a surgical site infection is and how it can be prevented using proper hygiene methods. Once the pamphlet is submitted to the Patient and Family Education Committee, it will be included in the preoperative packet. In addition to creating the handout, an assessment tool will be given to nurses on the preoperative unit. This assessment tool will be used to collect data on whether or not the preoperative patients are coming onto the unit as clean or dirty.

Rationale

The hospital's preoperative unit has been having an increased rate of SSIs for the past year. After an extensive root cause analysis was conducted, the CNL students identified what could be causing the increase of SSIs. Multiple factors including the patient population, environment, lack of patient education, and the healthcare team not making time to properly clean the patient all contribute to this problem.

Many low income-families may not have access to running water to shower their child or at times may not have the funds to afford antimicrobial or chlorhexidine gluconate (CHG) soaps. There are also families who are not educated about using these types of soaps. Along with education comes timing. Nurses are educating families about preoperative hygiene practices long before the day of the procedure. Parents can either forget or simply be distracted with other important information. The healthcare team is also held responsible for their patient. Not every preoperative patient is given a CHG bath before surgery. The surgical team only provides this for certain surgical procedures and is expecting that patient's families are compliant with hygiene

practices. By using critical thinking and conducting a literature review, the CNL students found methods to decrease the rates of SSIs in this microsystem.

Literature Review

The CNL student conducted a literature review using CINAHL, Science Direct, and PubMed search engine databases. In this analysis, the following search terms were used in addition to “surgical site infections”: prevention, education, hygiene practices, showering, CHG, antimicrobial soap, and pediatrics. To narrow the search, peer reviewed articles and publication dates used were from 2013 to 2018.

In pediatric patients undergoing cardiac surgery, SSIs account for up to one in four of all health care-related infections (Cannon et al., 2016). Postoperative cardiovascular surgical site infections can lead to increased mortality, morbidity, and health care costs. In order to reduce the incidence of surgical site infections, surveillance and process measures were implemented. Education on preventative measures and appropriate preparation the night before surgery included a skin preparation protocol that used either CHG or Sage Comfort Bath. It was found that among 260 reported cases, 10 were suspected SSIs. These results indicate that effective measures of SSI prevention include both education and hygiene practices.

A retrospective study by Keenan, Speicher, and Thacker (2014) was performed in order to determine the effect of a preventative SSI bundle on SSI rates and costs. The bundle included patient education materials that discussed methods on how to prevent a SSI and preventive hygiene methods. During the study period, 212 cases were examined before and after the implementation of the bundle. The study concluded rates of SSI were reduced by 19.3%. Researchers concluded that the bundle was an effective tool for improving the quality of patient care and reducing rates of SSIs.

Spinal surgery is complicated by its incidence of 1% to 9% of surgical site infections (Anderson et al., 2017). A literature review was performed to provide a narrative review of the practical solution to reduce SSIs in spinal surgery. Efforts to improve its safety have been focused on using quality improvement efforts as well as a bundle approach. Results indicated that reduction of SSIs are possible, however, a systematic approach involving all stakeholders is necessary. This includes a culture change where all team members, including the patient, should be educated in order to prevent SSIs. Evidence suggests that an eradication regimen or preoperative showering with antiseptic agents can significantly reduce the rates of SSI in patients undergoing surgical procedures.

The CDC has provided new and updated evidence based recommendations for the prevention of surgical site infections.(Berríos-Torres, Umscheid, & Bratzler, 2017). A systematic review of literature was conducted in EMBASE, CINAHL, MEDLINE, and the Cochrane Library from 1998 to April 2014. Preoperative findings concluded patients should shower with antimicrobial soap or an antiseptic agent on at least the night before surgery. These guidelines have been incorporated into hospital's surgical units so that patient safety is improved.

A study by Edmiston, Lee, and Krepel (2015) was performed to evaluate the efficacy of this protocol compared to other methods published on preoperative skin preparation. One hundred twenty volunteers were randomized to either use two showers with two bottles or three showers with three bottles of CHG. The study concluded there was no significant difference in CHG skin surface concentrations between participants who had used two versus three bottles. An important factor of the quality improvement project was patient adherence. In effort to improve adherence, patients were sent a text message or email-reminding individuals to complete their preadmission showering process. Those who received the electronic alert reported having higher

patient adherence to the preadmission shower protocol. The study concluded that although the use of chlorhexidine gluconate is not directly related to reduce the incidence of surgical site infections, its standardized approach of being used in preadmission showers is effective in inhibiting or killing microbial pathogens harbored on the skin. These two components are essential in an effective surgical care bundle.

According to a study by Zellmer, Zimdars, Parker, & Safdar (2014) there is much improvement needed for patient education materials regarding SSIs. The study conducted an environmental scan of materials for patient education on SSIs. They used major search engines such as Google, PubMed, and Bing and keywords such as: SSI, SSI prevention, what can patients do to prevent surgical site infections, and education materials on SSIs. By using the Patient Education Materials Assessment Tool (PEMAT), materials were measured for their “understandability” and “actionability”. Of the 21 materials, 75% averaged with understandability and 49% with “actionability”. Findings of the study suggest that materials available need to be optimized from the patient’s viewpoints.

In a survey examining patients awareness and understanding of SSI risks and consequences, it was found that of 52 patients, 16% could not recall if a healthcare worker talked to them about what a SSI was and 42% felt the total time spent talking about the SSI was less than 5 minutes (Anderson, Ottum, Zerbel, Sethi, Gaines, & Safdar, 2017). Even though 94% reported they were comfortable with their knowledge of SSI, 26% thought the education portion could be improved. Findings from the study suggest that patient preferences need to be incorporated in patient education materials and strategies.

Results of the studies indicate the importance of patient education and preventative hygiene measures. Patients are in need of educational materials that discuss why they should be

involved in their preoperative care. Support from the healthcare team can promote patient engagement.

Cost Analysis

The development of a surgical site infection causes an economic burden for many hospitals. This is due to the increased financial costs for prolonged hospitalization, diagnostic testing, and treatments. An estimated SSI can range from \$10,443 to 25,546 per infection (“First Update of Surgical Site Infection (SSI) Guidelines by CDC in 18 Years”, 2017). After contraction of a SSI, some patients may require reoperation(Badia et al., 2017). Additionally, it has been found that patients who develop a SSI can constitute approximately double in financial burdens compared to those who do not develop a SSI. The cost of SSIs can displace hospital resources as well as delay other patients’ surgeries.

For better clarification, a retrospective study by Shepard et al.(2013) aimed at determining the change in hospital profit due to SSIs. The patients with a SSI had an average LOS of 10.5 days versus 5.6 days for those patients without a SSI. The 30-day readmission rate for patients with a SSI versus without a SSI was 51.94 and 8.19. If all 547 patients with a SSI were eliminated, the data found that the John Hopkins Health System would experience an estimated cost increase of \$2,606,865 annually and billable capacity increase of 103 annually, which equates to \$3,255,024 annually. Additionally, if payers refused to reimburse for 30-day readmission related to the SSIs, then the elimination would increase revenue of approximately \$6,082,425 annually. Findings from the study suggest that if the health system eliminated all SSIs in that period, the total change in profit would be \$2,268,589 and \$12,164,457 if it assumed 30-day readmission would not be reimbursed.

The financial impact of SSIs can contribute to a facility's rate of readmission and be a determining factor for hospital performance. Hospitals must improve their patient care and safety. While implementation of this project will not completely eradicate SSIs, it will contribute to a decreasing rate.

Microsystem Assessment

The 5 P's

Purpose

The purpose of this 18-bed unit is to prepare patients preoperatively for surgery.

Patient

The patient populations on this unit are both male and female preoperative pediatric patients. Most patients are White, Hispanic, or Vietnamese. They are covered by private insurance plans, Medi-Cal, or are provided by California Children's Services (CCS) (CHOC Children's, 2014).

Professionals

The professional team on this unit consists of a charge nurses, nurse manager, RN nurses, physicians, and surgeons. The number of healthcare staff varies per shift.

Process

Preoperative patients are asked to remove all clothing and jewelry and will be given a hospital gown. The nurse will take vital signs, review medications, insert an IV, and answer any questions that the patient or caregiver might have.

Pattern

Once patients are settled in the preoperative room, a preoperative nurse will confirm the child's planned procedure and review health information. After the nurse is finished, the surgeon and

anesthesiologist will meet with the patient and family. Once questions and concerns are answered and necessary forms are completed, the child will proceed to the operating room.

Methodology

The purpose of this project is to educate patients and families about the importance of SSIs and methods of hygiene that can prevent them. The CNL students were provided statistical data that showed increased rates of SSIs. Additionally, CNL students spoke to the preoperative nurses regarding the cleanliness of their patients. Most preoperative nurses stated that their patients were not considered clean on the day before their surgery. CNL students suggested the creation of an assessment tool that considered the patient either clean or dirty. The nurses suggested that one method they used to consider their patient dirty was by seeing how many alcohol swabs it took before they could start an IV. Together with this knowledge and research for best-used practices, the CNL students created a SSI Prevention Assessment Tool. It included five general appearance categories and one supplemental question. The CNL students asked for a total of 75 surveys. To thank the preoperative nurses for their compliance, a cookie tray was given as an incentive. While preoperative nurses were supportive of this project, some were worried about having an increased workload due to filling out the survey. They thought this would be an additional task that would take time away from being spent with their patients or interfere with completing their nursing tasks. The CNL students, students' preceptor, and nurse manager kindly explained that this would simply be included as part of their patient assessment. The CNL students' preceptor collected these surveys upon completion. (See Appendix A for SSI Prevention Assessment Tool).

Once the survey was distributed, the CNL students began working on the educational pamphlet. The CNL students determined its need based on two reasons: information regarding

SSIs and preventative hygiene methods were not included in the preoperative packet and nurses stated that patients were coming onto the unit dirty. CNL students created the pamphlet, *Preventing Surgical Site Infections at Home*. This pamphlet included a brief overview regarding what a surgical site infection was and hygiene methods on how to prevent them. Currently, the handout is being reviewed by the Patient and Family Education Committee and is still waiting for approval so that it may be included in the preoperative packet. (See Appendix B for *Preventing Surgical Site Infections at Home*).

The day before surgery, families receive a phone call from the preadmission testing (PAT) nurse who will ask updated information regarding the patient. CNL students created a “Bathing Instruction Script”, that confirmed if the family received the *Preventing Surgical Site Infections at Home* pamphlet. If families confirmed receiving the pamphlet, they would be asked if they had any questions regarding it. This creates an opportunity for the preoperative nurses to see if caregivers are receiving the materials provided and if so, are they following along with its instructions. By educating patients and families on the importance of preventive measures, the CNL students hope to see a decrease in the rates of SSIs. (See Appendix C for “Bathing Instruction Script”).

Timeline

The CNL students created a timeline for the development and implementation of the project. After meeting with their preceptor, the CNL students began their research of the literature for preventative hygiene practices. Upon completion, the CNL students assessed the preoperative unit and spoke to the preoperative nurses about their project. Once they developed and distributed their assessment tool, creation of the educational pamphlet began. Since the Patient and Family Education Committee are still reviewing the educational pamphlet, the CNL

students were not able to determine its effectiveness in reducing rates of surgical site infections. (See Appendix D for Gantt Chart).

Data Tool

The CNL students used the SSI Prevention Assessment Tool as their method to collect data on the number of patients who were considered clean or dirty. At the top of the audit, there was a blank where nurses were to fill out the date the assessment was being done. Following the date, nurses were to read the directions regarding filling out the survey. There were five general appearance categories and one supplemental question. In the first column it included the five categories of: clothes, skin, hair, nails, and excessive dirt on alcohol pad at IV insertion site. In the column next to it was the option of either circling “Yes” or “No”. Circling “Yes” meant that there was visible dirt, soil, or grease. Circling “No” meant clean and neat. The supplemental question provided asked if the patient received a bath/shower within the last 12 hours. Circling “Yes” meant the patient received a bath/shower and circling “No” meant they did not. The CNL students determined that in order for the patient to be considered clean all general appearance categories must be circled with a “No” and the supplemental question must be circled with a “Yes”. If any of the general appearance categories responses were circled with a “Yes” or if the supplemental question was circled with a “No”, the patient was considered dirty. Failure to circle either any of the general appearance categories or the supplemental question would be labeled as “N/A” and would not be included in part of the final results. (See Appendix A for SSI Prevention Assessment Tool).

Results

Sixty SSI Prevention Assessment Tool audits were collected from June 4, 2018 to June 28, 2018. Of these 60 audits, 20 were labeled as “N/A” and were omitted in the results. This left

a total of 40 audits for the total data collection. Overall, 28 patients were clean and 12 patients were dirty. This meant that of 40 patients, 70% were clean and 30% were dirty. The CNL students were unable to collect and analyze data from the implementation of the educational pamphlet in the preoperative packet. The proposed idea of reducing the rates of SSIs from this pamphlet cannot be produced until its implementation has been done. (See Appendix E & Appendix F for Data Tables).

Discussion

Results from the assessment tool audits indicate that majority of patients were considered clean. The CNL students were surprised to find these results as nurses on the preoperative unit claimed that their patient population was mostly dirty. It was also found that for the months of June and July, there were no reported SSIs in the preoperative unit. When speaking to the CNL students' preceptor, no additional protocols had been implemented. Since the literature review does support that patient education and hygiene measures are important for the prevention of SSIs, the CNL students are confident in their approach. Even though the sample population used was small, there are still 30% that need patient education or hygiene prevention.

Limitations

There are several limitations to this study. The patient population consisted of both inpatient and outpatient. Lack of control over the patient population made it difficult to determine which patient had access to methods of hygiene prevention prior to the preoperative unit. The nurses seemed confused by the directions in the SSI Prevention Assessment Tool audits. Several returned audits had hand-notes written as well as scribbles and arrows indicating what they meant to circle. Opinions regarding the cleanliness of a patient are subjective. Even though the preoperative nurses stated that most children come dirty to the unit, results indicated

that majority of them were found to be clean. Several surveys were discarded due to lack of completion. This resulted in using a smaller sample size of the population.

Nursing Relevance

As health care providers, nurses play a significant role in educating patients. Education empowers patients be more involved in their care, which means they are more likely to engage in interventions that can make positive health outcomes. This project will have a significant contribution of understanding how patient education can influence change. At times, nurses may overlook taking the time to educate their patients or assume that patients will already have the general knowledge. By implementing the pamphlet, nurses will notice that education can highly impact change. Patients will have quick, accessible information regarding SSIs and if needed, they can contact their healthcare team about any questions or concerns. This will motivate patients to be engaged in preventive hygiene methods.

The nursing mission on this unit is to put the patient's care first. Meaning that the healthcare team will do everything they can to provide excellent care. They want to assure that the patient's surgery will run smoothly without any medical errors. Their goal is for the patient to be ready with all preventive measures already implemented. This project helps reinforces this mission. It expresses the importance of nurses working together as part of the interdisciplinary team to provide quality care. By implementing the hygiene pamphlet, nurses are being patient advocates who are promoting safety and reducing the chance of harm.

CNL Relevance

As an expert clinical resource, a CNL is the best choice for this project. CNLs are advanced generalists who are trained for designing, implementing, and evaluating patient care. They have the professional capability of identifying the needs of a microsystem and

implementing a quality change project that can improve patient outcomes. The CNL demonstrates competencies that allow them to execute projects from start to finish. In this project, the CNL will demonstrate the competencies of *Quality Improvement and Safety* and *Interprofessional Collaboration for Improving Patient and Population Health Outcomes* (American Association of College of Nursing, 2013). By performing a comprehensive microsystem assessment, the CNL will be able to identify the need for a quality improvement project that will decrease rates of SSIs. Using evidence-based practices, the CNL will design and implement a project that uses safety and quality performing measures. Working with the interprofessional team, the CNL collaborates methods that can be used in the creation of this project. Since nurses are at the frontline of preoperative care, the CNL will integrate their ideas to design strategies that will improve patient outcomes. The CNL is competent in delivering this quality improvement change.

The major contribution CNLs make to this environment is how they demonstrate their ability to improve patient outcomes. CNLs perform in depth microsystem assessments and conduct extensive root cause analysis in order to identify why the issue exists. By working closely with the healthcare team, they then use evidence-based practices to implement quality improvement strategies. The CNL students demonstrated this by going to the unit and performing these assessments. They spoke to their preceptor, nurses, and nurse managers in order to identify the barriers of preventative hygiene practices. They analyzed the hospital's trend of increasing SSIs and what measures had already been implemented. They researched best hygiene practices and used this to create their educational materials. By personally speaking to the nurses on the preoperative unit, the CNL students were able to create an assessment tool that would help collect this data. This project could not have been successful without the help of the

CNL students, the CNL students' preceptor, nurses, nurse managers, and the Patient and Family Education Committee. The CNL students used their preceptor's guidance and knowledge as a resource for improving their project materials. Compliance from the nurses on the preoperative unit allowed the CNL students to collect data for their assessment tool surveys. Without the Patient and Family Education Committee, there would not be an educational pamphlet to be given. The time and effort contributed by all of these individuals helped build this project to its success.

Future Directions

The CNL students were unable to implement their educational pamphlet as it is still under review from the Patient and Family Education Committee. Lack of communication between the CNL students, CNL students' preceptor, as well as the committee, seemed to have delayed its execution. It is imperative that future CNL students take initiative in collaborating more with the committee. There are several gaps in the SSI Assessment Prevention Tool. Recreation of the tool will provide for a better data collection. Additionally, the CNL students believe it would be best if either the CNL students or a group of assigned nurses conduct the assessments. This in turn will reduce biases as well as increase sample size. Once the educational pamphlet is approved, it will be distributed in the preoperative packets. Over the course of 90 days, data will be collected regarding the number of surgical site infections.

Conclusion

This quality improvement project focuses on implementing an educational pamphlet that will increase patient compliance with preoperative hygiene methods. Using the competencies of quality improvement and interprofessional collaboration, the CNL students assessed the hospital's preoperative unit and created an assessment tool that was used to analyze patient's

hygiene. Even though results indicated that majority of patients were found to be clean, CNL students believe that recreating the assessment tool will lead to more accurate results and increased sample population size. By performing a literature review, CNL students were able to use evidence-based practices in creating their pamphlet, *Preventing Surgical Site Infections at Home*. Upon implementation of this pamphlet, CNL students hope to see decreased rates of SSIs in the hospital's preoperative pediatric population.

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Appendix A

Date/Time: _____

Pre-Operative Unit – SSI Prevention Assessment Tool
 (USF School of Nursing and Health Professions)

Please circle the best response to describe your patient’s general appearance.	
Please assess the presence of dirt, soil, grease, on the following:	
	Yes= Visible dirt, soil, grease, etc No= Clean and neat
Clothes	YES / NO
Skin	YES / NO
Hair	YES / NO
Nails	YES / NO
Excessive dirt on alcohol pad at IV insertion site	YES / NO

Supplemental Question:

1. Did the patient receive a bath/shower within the last 12 hours? YES / NO

Appendix B

Preventing Surgical Site Infections at Home

The handout you received called “FAQs about Surgical Site Infections” explains what a surgical site infection is, and some of the things that hospitals (including CHOC Children’s) are doing to prevent them. This handout will explain the important role you can take in protecting your child’s health and steps you can take to reduce their risk of a surgical site infection.

What is a Surgical Site Infection?

- Surgical site infections occur when germs get in the surgical wound
- SSIs can increase the length of time your child stays in the hospital and lead to further health complications
- Many SSIs are caused by the same germs that normally live on our skin

How can I help prevent a Surgical Site Infection?

Before your child’s surgery:

- Tell your child’s doctor about any medical problems your child may have.
- Decrease exposure to smoke. Patients who smoke, or are exposed to smoke, get more infections.
- If your child shaves, they should not shave near the area where they will have surgery. Shaving with a razor irritates skin and makes it easier for germs to enter.
- Give your child a shower the night before or morning of their surgery.
 - It is normal for germs to live on our skin, showering removes some of those germs which may lower the risk of infection.
 - It is very important to use clean linens (washcloths, towels, clothes/pajamas, bed sheets and blankets) after you shower your child. Using linens that haven’t been freshly washed could transfer more germs on to your child’s skin.
 - If the doctor has given you specific instructions and special soap, follow those instructions. If not, follow these steps to make sure you are removing as many germs as possible:
 1. Wash and rinse hair using normal shampoo
 2. Use soap and warm water to form bubbles on a clean washcloth or your hands
 3. Scrub the entire body to remove dirt. Don’t scrub too hard- you don’t want to irritate or break the skin
 4. Pay special attention to the neck, under arms, nails, breasts, feet, groin, and any other skin folds
 5. Rinse the soap completely using warm running water
 6. Pat the skin dry with a clean towel
 7. Do not put anything on the skin after washing. No lotion, cream, powder, or perfume

8. Dress with clean clothes or clean pajamas
9. Place clean, freshly washed sheets on the bed so no germs get back on the skin

At the time if your child's surgery:

- Speak up if someone tries to shave the surgical site with a razor. Shaving with an electronic clipper is safe because it does not irritate the skin. Talk with your surgeon if you have any concerns.
- Ask if your child will get antibiotics before surgery.

After your child's surgery:

- Make sure all hospital staff members clean their hands before examining your child. If you do not see them clean their hands, please ask them to do so.
- If your child can understand, teach them not to touch their surgical wound.
- Before you go home from the hospital, make sure you understand how to care for the wound. Ask the nurses or surgeon if you have any questions or concerns.
- Always clean your hands before and after caring for the wound.
- Make sure family and friends clean their hands before and after visiting your child. Friends and family should not touch the surgical wound or dressing.
- Before you go home from the hospital, make sure you know who to contact if you have questions or problems.
- Look for signs of an infection- If you see any redness, drainage or pus, or if your child gets a fever, call your doctor immediately.

Please contact the CHOC's Children if you have any questions regarding these instructions.

References

Centers for Disease Control and Prevention. (2018). *About Surgical Site Infections*. Retrieved from https://www.cdc.gov/HAI/pdfs/ssi/SSI_tagged.pdf

Children's Hospital of Georgia. (2016). *Pediatric Preoperative Bathing Instructions*. Retrieved from <https://www.augustahealth.org/media/file/Pediatrics/109422%20-%20Pediatric%20PreOp%20Bathing%20Instructions-Cardiovascular%20and%20Orthopedics%20copy%20WEB.pdf>

Foris Surgical Group, LLP. (2018). *Instructions for Chlorhexidine (CHG) Shower/Bath*. Retrieved from <http://www.forisgroup.com/wp-content/uploads/2015/10/CHG-Instructions.pdf>

University of Michigan Health System. (2013). *Showering Instructions Before Surgery*. Retrieved from <https://www.med.umich.edu/1libr/InfectionControl/showeringbeforesurgery.pdf>

Appendix C

Bathing Instruction Script for PAT nurses

Did you receive Preventing Surgical Site Infection at Home pamphlet?

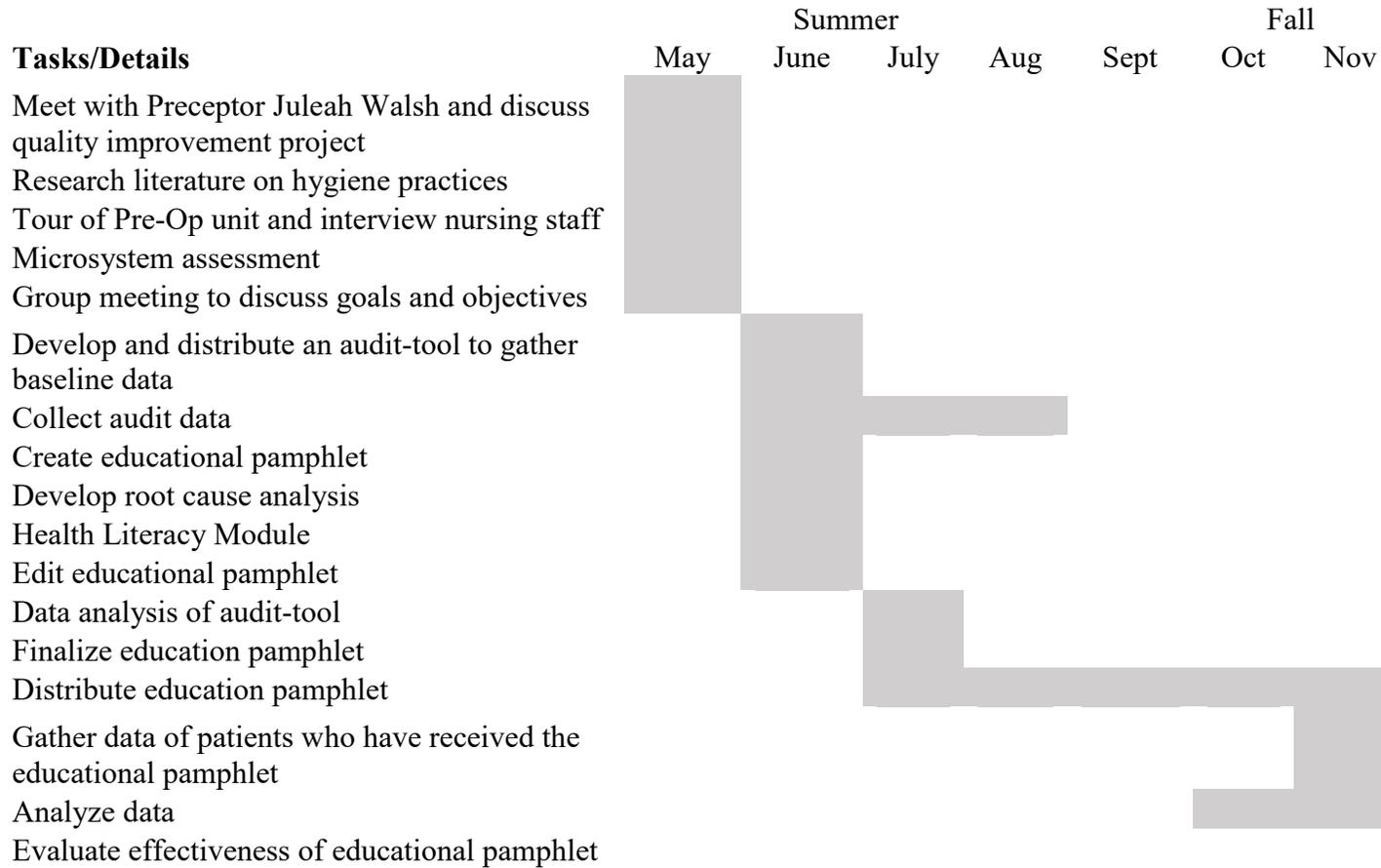
Do you have any questions? (If answer is yes, see instructions below)

Before your child's surgery:

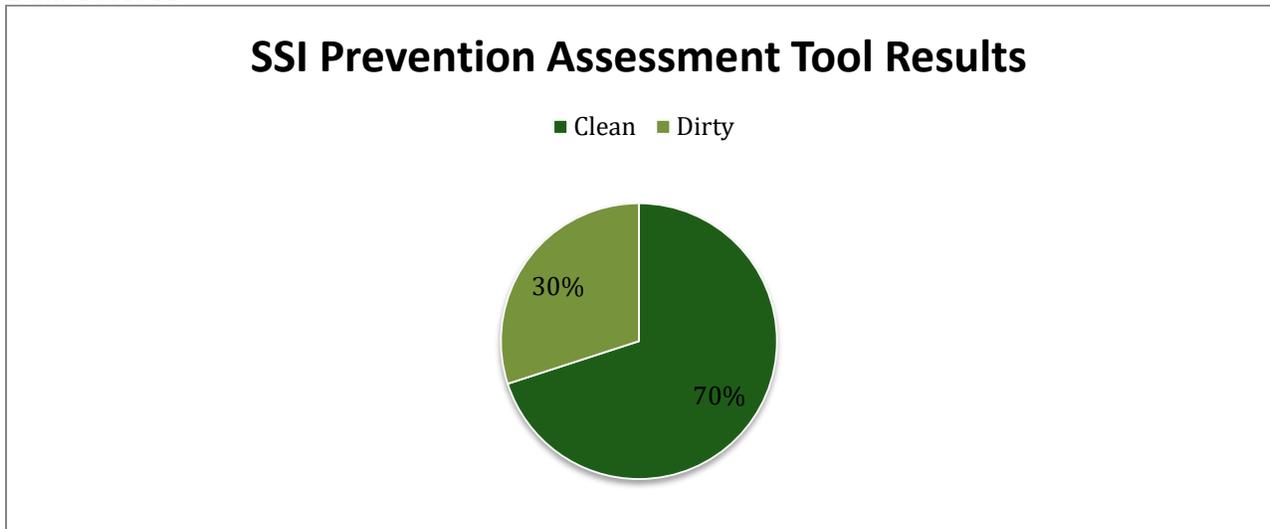
10. Wash and rinse hair using normal shampoo
11. Use soap and warm water to scrub the entire body to remove dirt. Pay special attention to the neck, under arms, nails, breasts, feet, groin, and any other skin folds
12. Rinse the soap completely using warm running water
13. Pat the skin dry with a clean towel. Do not put anything on the skin after washing. No lotion, cream, powder, or perfume
14. Dress with clean clothes or clean pajamas. Place clean, freshly washed sheets on the bed.

Appendix D

USF Surgical Site Infection Prevention Project Gantt Chart

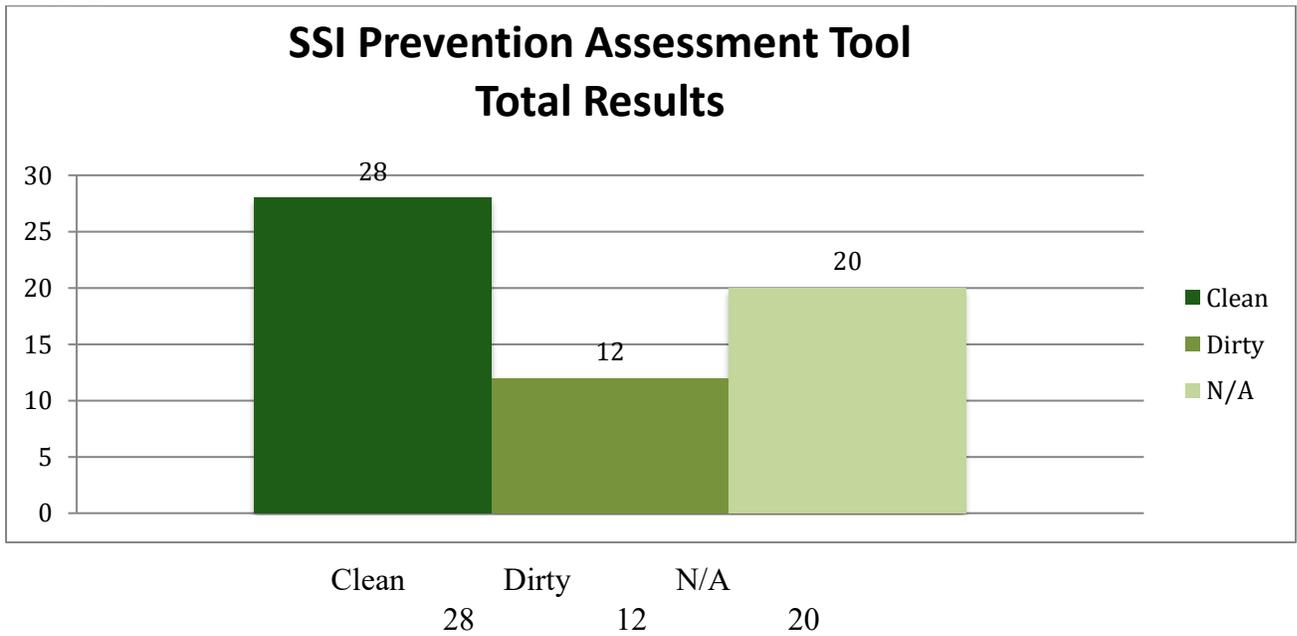


Data Table A



Clean	Dirty
28	12

Table B



All Data Results

	Shower	No Shower	N/A
All categories "No"	28	2	2
All or at least one category "Yes"	6	4	3
	11	4	
Total	45	10	5