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A Preoperative Hand Hygiene Campaign: " No One Left BeHand."

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TABLE OF CONTENTS

Section VII: Appendices

Abstract

Problem: Surgical site infections (SSIs) account for 20% of all hospital-acquired infections (HAIs). Performance of consistent, accurate hand hygiene practices by healthcare workers is the most effective means of preventing infection, yet the average compliance rates remain low. The preoperative (PREOP) unit carries tremendous responsibility for decreasing each patient's risk for SSI by adequately following the World Health Organization (WHO) guidelines for hand hygiene. The PREOP remains at a low average hand hygiene compliance rate of 69%, with decreased consistency, frequency, and knowledge deficit of hygiene practices. The aim of the quality improvement (QI) hand hygiene campaign is to increase compliance among the PREOP registered nurses (RNs) and patient care technicians (PCTs) to promote infection control and decrease the risk of SSIs.

Context: The PREOP serves multiple specialties with an average of 45 cases a day. The PREOP unit can significantly contribute to the reduction of SSIs with strict adherence to hand hygiene protocols. The RNs and PCTs provide direct patient care measures to several disciplines, including orthopedic, podiatry, head and neck, general surgery, gynecological, and urology surgery patients. A fast-paced work environment, lack of time, and low morale were listed as barriers to hand hygiene adherence. An SSI, on average, costs $30,000 for just one case. Diminishing the knowledge deficit by using WHO guidelines and improving overall cleanliness are the most influential factors for maintaining collaboration to support the efforts of reducing a patient's risk of SSI.

Interventions: The QI project involves the implementation of a multidisciplinary PREOP hand hygiene campaign using a multimodal approach over a single intervention strategy. The interventions include (a) hands-on training and education; (b) campaign slogan, signs, and songs;

(c) daily direct observation audits and huddles to discuss barriers; (d) monthly secret observer audits; (e) RN and PCT scripting; (f) increasing access to supplies; (g) PREOP RN process map; and (h) patient prompting tools.

Measures: The outcome measures are the results of the daily direct observation audits by the champions and mangers, and the monthly secret observer audits by the quality department. The hand hygiene knowledge quizzes for staff and the patient participation tool survey are the two process measures. The balancing measure is the monthly tracking of the average PREOP RN patient preparation times using the electronic health documentation system.

Results: The PREOP hand hygiene campaign has reached a 13% increase in RN and PCT hand hygiene compliance within four months. Combined direct observation audits by champions and secret observations by the quality department revealed an 82% average compliance rate. Quiz scores have improved from 76% to 85%. PREOP RN preparation times have remained unhindered at the current time of 34 minutes. The project leader anticipates the patient prompting tools to increase confidence in patients' abilities to contribute to infection prevention.

Conclusions: Performance improvement projects using quality improvement tools, along with WHO standards, in combination with intervention strategies with patient participation, gained beneficial hand hygiene campaign outcomes. Linking theories into actions and improving team motivation and dedication helps push through the barriers. Achieving insights and growing awareness strengthens the efforts towards sustainability. Continuous monitoring and quarterly champion meetings, along with annual competency expectations, will ensure long-term project effectiveness. This hand hygiene campaign can be quickly adapted and spread from unit to unit to uphold a dedication to the pledge of reducing HAIs.

Section II: Introduction

The ethical principle of *nonmaleficence*, meaning *do no harm*, is a common bioethical term used by healthcare workers today to denote their moral obligation to prevent contamination (Devettere, 2016). Performing hand hygiene is the most effective method of infection control and prevention in reducing healthcare-associated infections (HCAIs), also known as hospital-acquired infections (HAIs; Tan & Olivo, 2015). Despite this compelling notion to halt infection risks, decreased hand hygiene compliance rates among healthcare workers within hospital settings and the challenges to improve proficiency remain unchanged (Cunningham et al., 2018).

The Joint Commission's (2019) National Patient Safety Goal 7 is to reduce the risk of HAIs by complying with the Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO) hand hygiene guidelines. Surgical site infections (SSIs) account for 20% of all HAIs, with seven to 11 additional postoperative days in the hospital and a 77% mortality rate (Anderson et al., 2014). Berrios-Torres et al. (2017) emphasized the application of evidence-based antiseptic strategies to help reduce a patient's risk of infection and the costs associated with identified SSIs. The WHO (2020) asserts that effective infection prevention using proper hand hygiene practices decreases HCAIs by at least 30%.

The Northern California regional hand hygiene policy provisions require healthcare workers in direct patient care roles to follow the WHO's (2009) five moments of hand hygiene guidelines, using an alcohol-based gel/foam as the preferred decontaminate method, unless hands are visibly soiled, and washing hands for at least 15 to 20 seconds (Kaiser Permanente [KP], n.d.a). The WHO's "My 5 Moments for Hand Hygiene" guideline includes washing your hands or using at least a 60% alcohol gel rub before entering and after exiting a patient's room, prior to

performing aseptic procedures or touching a patient's surroundings, and after being exposed to bodily fluids. Hand hygiene is the single most important first step to mitigate infection dangers before performing each of the required SSI regional bundle elements (KP, 2018). The preoperative (PREOP) SSI bundle elements include obtaining a patient's weight and blood sugar level, warming the patient with a forced-air device, removing surgical site hair with clippers, and wiping the surgical site with chlorohexidine (CHG).

A PREOP department in a hospital setting is the focused microsystem for the hand hygiene campaign. With strict adherence to hand hygiene protocols, the PREOP unit can significantly contribute to the reduction of SSIs. The PREOP serves several specialties, such as total joints, general surgery, gynecology, podiatry, head and neck, and urology. The surgical patients' ages range from 1 year to 100 years, with an average of 45 patients cared for daily. The direct patient care staff consists of primarily registered nurses (RNs) and patient care technicians (PCTs). The majority of the PREOP staff have 10 to 20 years of clinical experience as healthcare workers, with a median age of 50 years; however, confidence in their skills and abilities appears to be wavering due to increased workloads and demanding timeframes. The prevalent safety culture in the PREOP focuses on preventing staff injuries, not on the importance of hygiene. Sharing current SSI prevention data with the PREOP staff will generate informed understanding and magnify the purpose of making changes to current practices. Seeking opportunities to improve both collaboration and morale will help build team resiliency and drive the commitment towards a compliant hand hygiene program.

Problem Description

Hand hygiene audits from the quality department show PREOP at a low average rate of 69% compliance. The Quality Dashboard (KP, n.d.b) displays a significant increase in superficial

infections as of October 2019, compared to 2018's overall sum. The PREOP team started the regional SSI bundle elements workflow in July of 2017, with a reboot implemented in February of 2018. CHG cleaning by PREOP RNs is currently at a high compliance rate of 94%, and clipping data shows success, with a negligible 2% of clipping done in the operating room (OR). However, the team has not been able to consistently meet the combined target of 90% compliance in all bundle elements, and the number of SSIs identified continues to rise.

The tasks of CHG wiping and surgical site clipping are more complicated and time-consuming; yet, their compliance rate is higher than PREOP RNs' and PCTs' handwashing. The pre-intervention hand hygiene knowledge quiz shows an average score of 76%. Manager observation audits using Kamishibai cards (a Lean methodology tool) to track hand hygiene techniques, timing, and adherence are demonstrating a decrease in conformity. Frequent observations show a lack of handwashing or gel/foam usage in and out of patient bays. Gloves are donned and removed without handwashing being performed. RNs and PCTs are rushing from patient to patient, touching patients and their belongings, and handling bodily fluids without performing hand hygiene in between care measures. Therefore, it is obvious that strategies to improve and monitor hand hygiene in the perioperative area are necessary to contribute to the reduction of SSIs (see Fishbone diagram in Appendix A).

The American College of Surgeons (n.d.) National Surgical Quality Improvement Program (NSQIP) provides tools and reports to improve surgical care quality and safety, and measures organizational priority outcomes. HAIs (specifically SSIs), falls, and retained foreign objects are recorded monthly and given a risk-adjusted odds ratio to monitor progress. The NSQIP risk-adjusted odds ratio target for SSIs is 0.82. As of November 2019, the hospital stands at 1.38, much higher than its objective (KP, n.d.b). Deep, organ space, incisional, and superficial

are the four types of SSIs monitored with general surgery, with orthopedic surgical cases having the highest susceptibility. The WHO (2016) developed guidelines for preventing SSIs, focusing on the need for suitable training and active participation in all perioperative phases. Initiation of a dynamic, evidence-based, and multidisciplinary PREOP hand hygiene program will help boost adherence to contribute to SSI reduction efforts (Pincock et al., 2012).

Available Knowledge

PICO Question

The PICO question helps narrow the extensive available knowledge on hand hygiene to specifically inquire: For RNs and PCTs in the PREOP (P), how does the implementation of a multimodal hand hygiene campaign along with patient participation (I), compared to a single intervention strategy (C), improve hand hygiene compliance and contribute to the reduction of a patient's risk of SSIs (O)?

Literature Review

The search strategy was limited to English-only articles with CINAHL Complete, Pub Med, Joanna Briggs Institute EBP Database, and Cochrane Library search engines. The key search words used were *improving hand hygiene compliance, multimodal interventions,* and *patient participation*. The eight journal articles with the most detailed favorable evidence are included to support the PICO question. Each article was appraised and given a level of appraisal by using the John Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal Tool (Dang & Dearholt, 2018).

Tschudin-Sutter et al. (2019), using a cluster-randomized trial at 12 hospital wards, discovered that a modified and simpler 3-step technique, when compared to the 6-step WHO handwashing technique, resulted in higher hand hygiene compliance. Improvement in both hand

hygiene indications and proper techniques occurred with the new benchmark 3-step method, increasing execution from 51.7% to 75.9%. Doronina et al. (2017) observed RNs in three random controlled trials. Hand hygiene rates significantly increased from 51% to 86% before patient contact and 75% to 91% after patient contact. Combined strategies ensuring accessibility and enforcing accountability with goal setting and reward incentives were more effective than single interventions for greater hand hygiene conformity.

Farhoudi et al. (2016) endorsed the implementation of the WHO multimodal hand hygiene approach from the Global Patient Safety Challenge of 2009 to improve hand hygiene compliance using five dynamic strategies. The plan consists of improving availability and access to alcohol-based hand gel, continuous training and education, performance assessments and feedbacks, prompts, and establishing a safety culture. Using WHO hand hygiene observation forms significantly improved RNs' compliance from 29.8 % to 70.98%. Butenko et al. (2017), in their systematic review, showed that organizational structures support a partnership between patients and healthcare professionals for hand hygiene compliance. To partner with healthcare professionals, the patients devised alternative, nonconfrontational, and nonverbal strategies to promote hand hygiene enhancement.

According to both Chassin, Mayer et al. (2015) and Chassin, Nether et al. (2015), the implementation of quality improvement (QI) projects targeting unit-specific remedies has the greatest potential for lasting handwashing compliance management. Using Six Sigma, a QI methodology, to measure noncompliance and develop multiple comprehensive interventions was achievable and reliable. Hand hygiene compliance increased from 47.5% to 81% and remained for 11 months (Chassin, Mayer et al., 2015). The targeted solutions tool created by the Joint

Commission was tested by 289 healthcare organizations, and 769 projects proved its effectiveness by improving compliance from 57.9% to 83.5% (Chassin, Nether et al., 2015).

Phelps and Reed (2016) achieved a systemwide 95% hand hygiene compliance rate by using the Hawthorne effect to accelerate cultural change. The incorporation of secret observers (anonymous workers), using the plan-do-study-act (PDSA) method of QI and empowering caregivers to speak up proved useful in identifying noncompliance and in developing solutions. Alzyood et al. (2018) improved patients' willingness to ask the handwashing questions from 25% to 79% by providing a simple script to help generate awareness. All the synthesized evidence suggests that performance improvement projects using QI tools, along with WHO standards, in combined intervention strategies with patient participation, gain the most productive hand hygiene campaign outcomes (see Appendix B for Evidence Table).

Rationale

PREOP RNs and PCTs carry a tremendous responsibility to promote cleanliness to decrease potential risks of the transmission of microorganisms to patients. Kotter's 8-step guidebook will provide structure and support for the PREOP hand hygiene campaign to produce permanent change (King et al., 2019). Kotter's theory hypothesizes that a crusade requires enough time to promote eager allegiance to a shared goal (Hix et al., 2009). Nurse leaders are encouraged to lead through transformation by guiding and influencing a need. Kotter's concept includes obtaining partnerships, collaborating on a united mission, authorizing unpopular actions, removing blockades, celebrating achievements, and affixing the contagious shift into a positive culture (Nelson et al., 2007). Examination of the current processes and recognition of social and physical norms will help shift from old habits and advance the clean hands campaign. The PREOP team will play an active role in communicating fallouts, getting feedback, and

generating an urgency to decrease missed opportunities. Forming a cohort-invested mission with members who are willing to speak up, will transform the philosophy of distraction and drift to one of a safe and value-driven atmosphere (King & Gerard, 2016). See Appendix C for Kotter's theory timeline.

Specific Project Aim

The specific aim for hand hygiene in the PREOP is to increase RN and PCT compliance from 69% to 99% within 180 days to help reduce patient risk of SSI. The aim will focus on 90% for the first two months, 95% by the end of the fourth month, and a target of 99% by the end of the sixth month. The corresponding objective is to increase RN and PCT hand hygiene quiz knowledge from 76% to 98%. Using a multimodal approach campaign following WHO guidelines will provide successful and sustained hand hygiene protocols (Gould et al., 2017). The use of the Hawthorne effect through direct observation interventions will improve performance, using persistent monitoring and reminders to increase reliance (McDonald et al., 2018). Awareness of being observed influences behavioral changes to encourage healthcare providers to perform hand hygiene practices more appropriately and frequently (Chen et al., 2015). Performing daily huddles to review adherence to standard practices, acknowledging barriers, and exploring solutions will ensure team responsibility. Inviting patients to participate as active safety contributors will enhance liability, support engagement, and empower a culture of excellence (Desai et al., 2017). See baseline hand hygiene audit graphs in Appendix D.

Section III: Methods

Context

Employing a hand hygiene campaign in a fast-paced PREOP unit is a challenge worth pursuing. Patients come in nervous and unsure of what to expect when preparing for surgery, trusting the care team to provide clean, high-quality care. Preparing a patient for surgery takes a varied amount of time, depending on the RN and the type of case. However, our PREOP aim is to match a 20-minute or less timeframe to help foster the OR 20-minute turnaround time from case to case. The OR has an on-time start metric to make sure 100% of surgical cases meet their scheduled surgery times. Every minute the patient is late to the OR costs the hospital money and decreases OR efficiency. The PREOP RNs and PCTs are under constant pressure to perform quickly and to maintain preparation times to keep up with the OR's demands, despite obstacles.

Teamwork productivity depends on everyone's ability to support the same efforts of reducing a patient's risk of SSI. Understanding what an identified SSI can cost the hospital and the physical, mental, and financial burdens experienced by the patients are the most influential factors. The Quality Dashboard (KP, n.d.b) February 2020 results show the PREOP's full bundle compliance rate at 83.2%, just 6.8% shy of the regional target. Noncompliance with hand hygiene protocols can significantly impact a patient's chance of contracting a HAI, which escalates their length of stay and potential mortality rate and lowers hospital revenue (Akanji et al., 2017). Developing a revised process map workflow to include each hand hygiene-designated moment is crucial to strengthen adherence and boost patient safety. See Appendix E for unit profile details.

Improving hand hygiene compliance requires the use of WHO recommendation guidelines to remedy the existing handwashing fallout habits. Five key elements are highlighted

by the WHO to achieve the best handwashing performance results. These focus areas include a system change, mandatory education and training sessions, constant observation and feedback, daily reminders, and enhancing the safety culture (Gyi, 2018). Creating a sense of perseverance to overcome potential permissive behavior using Kotter's theory methods and securing leadership engagement will ensure a successful and lasting hand hygiene consciousness. See SWOT analysis in Appendix F.

The United States has approximately 160,000 to 300,000 SSI cases every year, with average expenses per hospital topping $3.5 to $10 billion (Anderson et al., 2014). Turner and Migaly (2019) designated the cost of one patient with an SSI to be approximately $3,000 a day and up to or beyond $30,000 for the overall amount of care, depending on the level of infection, the investigation process, treatments needed, possible revision surgery, and length of stay in inpatient hospital and/or outpatient care. The project's return on investment will be increased by the decreasing costs spent on treating SSIs (see Appendix G). Psychological responsiveness, combined with suitable hands-on and habit-forming interventions, are necessary to demonstrate and predict improvement in hand hygiene overall (Srigley et al., 2015). RNs and PCTs admit that high demanding workloads, understaffing, and just the single complaint of lack of time hinder their abilities to maintain safe daily hygiene practices (Sadule-Rios & Aguilera, 2017). Assessing barriers, then making environmental modifications to the unit culture, will help RNs and PCTs to adapt more quickly to the new expectations and requirements to comply.

The project timeline has been interrupted due to the COVID-19 virus pandemic. All elective surgery cases since March 16, 2020, are cancelled until further notice. Therefore, all elements of the campaign cannot be implemented until the surgical caseload is resumed. RNs and PCTs are more mindful of handwashing protocols due to the virus; but there are very few

patient interactions to observe in the PREOP unit. The RNs and PCTs, along with the management team, are training to be deployed to assist in other units where the need is more significant.

Interventions

Persistent adherence to performing correct hand hygiene sequences is the goal of the project. The interventions will focus on both the physical and psychological benefits to the care team, safety maintenance, and the contribution to patients' positive surgical experiences and outcomes. Dedicated PREOP RN and PCT champions willing to speak up and coach live time will lead the change process and drive the campaign. Daily huddles to report adherence successes and barriers will be a part of all three executed PDSA cycles. See QI tools used for daily compliance tracking and a Pareto chart/barriers log in Appendix H. A driver diagram is in Appendix I.

PDSA Cycle 1 focuses on improving the hand hygiene knowledge deficit of the PREOP team. The projected aim for this phase is 90% hand hygiene compliance, along with 98% post-quiz scores. One-on-one training, with return demonstrations of proper handwashing and gel/foam rub techniques using measured amounts of alcohol-based products and ensuring adequate timing length, will kick off the project. Encouraging staff to sing the "Happy Birthday to You" song twice or the "ABC" song once while performing hand hygiene guarantees the recommended minimum of 20 seconds by KP regional policy, WHO, and CDC. Testing each team member's effectiveness of handwashing will be done by using Glo Germ, a gel product with simulated plastic germs, along with ultraviolet light for interactive visual illumination. Using the Tschudin-Sutter et al. 's (2019) 3-step technique, compared to WHO's 6-step regimen, will be tested. Seeing with their own eyes what areas they are missing when performing hand

hygiene helps substantiate the need for change. The pre-intervention quiz's most missed questions by the RNs and PCTs will be answered throughout this PDSA to reveal areas of expected competence (see Appendix J).

PDSA Cycle 2 necessitates the objective of making gel/foam stations more accessible in all patient care areas. Designing a more efficient and safer PREOP process map to include SSI prevention bundle elements, along with hand hygiene frequency, will cultivate active involvement. Thirteen inefficiencies showing inconsistent hand hygiene were highlighted in the baseline process map and will become mandatory process steps in the new workflow (see Appendix K). This intervention cycle seeks to improve hand hygiene compliance to 95% by adding verbal and visual cues, signage, slogans, a mascot to foster collaboration, daily reminders, and recognition for continuous support. The initiation of RN and PCT scripting seeks to communicate with patients before and after care measures. An example of a script is, "I am washing my hands to help prevent infection." Cue cards will be displayed by champions as visual aids to trigger positive responses to remind RNs and PCTs to engage in routine hand hygiene practices. On-the-spot recognition, with verbal feedback and celebration of short-term triumphs with valued incentives, acknowledges the team's hard work. See the flyer with the slogans "No One Left BeHand" and "Wash or gel to stay well" in Appendix L.

PDSA Cycle 3 requires patient participation in the endeavor to drive the campaign to meet a 99% hand hygiene compliance rate. The utilization of a patient prompting tool will facilitate patient empowerment and the patient's ability to be active partners in preventing infection. Visible signage and scripting provided to patients on arrival to PREOP, with encouragement from champions to join the hand hygiene effort to decrease SSIs, will promote persistence. Patient surveys will determine the confidence rate of using the tools, with a goal of

90%. A final push to reduce the remaining barriers to compliance will evaluate the team's capability to maintain and sustain an accomplished compliance rate and to advance further. Sharing the successes of the campaign with sister units will help spread the contagious movement. A Gantt chart with a timeline for all interventions is in Appendix M.

Study of the Intervention

The utilization of three main measures will evaluate the impact of the interventions. Each PDSA cycle will use the QI format to refine and guide the interventions. Screening the PREOP staff's ability to meet expectations of proper hand hygiene routines will be by firsthand, in-person, visual performance encounters, and reports generated to reflect successes and failures. Secret observers from the quality department will filter throughout the months to gain fresh visual perspectives on how the team is actively performing when they think no one is watching. The post-intervention quiz for all PREOP RNs and PCTs will display the effectiveness of the education and training sessions and the reliability and consistency of the processed knowledge. A patient post-intervention tool survey will show the usefulness of the tool and help gain insight into how the patients' involvement helped prevent infection in the PREOP area. The assessment will indicate the patients' amount of confidence using the tool and their feelings of contribution. Lastly, PREOP preparation times will be tracked and measured using the new process map, with hand hygiene moments included to safeguard patient and staff wellbeing while maintaining efficiency and timely OR start times. See the project charter in Appendix N.

Measures

RNs and PCT hand hygiene compliance rate is the primary evaluated outcome measure. The outcome measure is comprised of daily hand hygiene observation audits by managers, RN and PCT champions, and monthly quality department audits by secret observers. Direct

observation is the age-old *gold standard* for hand hygiene auditing. The percentage of compliant hand hygiene episodes get recorded by visual inspection using a specific checklist of hand hygiene opportunities, timing, frequency, and proper techniques to determine a positive or a negative outcome. Training all champion observers how to correctly calculate the percentage of compliance rate, while consistently utilizing the WHO's (2009) observation form, will improve the validity and reliability of the data collected (see Appendix O). The accurate retrieval of PREOP hand hygiene practice outcomes, using agreed-upon standard methods, facilitates straightforward application when employing observation audits in other units.

Nevertheless, compliance observation measures can be easily affected by several biases. Individual discernment, personal experiences, peer pressure, and wanting to support the allegiance can hinder the precision and uniformity of the observations (Jeanes et al., 2019). Investigating an adequate sample size of hygiene opportunities will expand generalizability and decrease the risk of observer and selection biases (Hagel et al., 2015). The Hawthorne effect, also known as a reactive responding tendency, will be used to the project's advantage to promote increased adherence through directly identified observers and by indirectly encouraging a culture of self-efficacy (Choi et al., 2019).

The first process measure focuses on the education and training of all PREOP RNs and PCTs using pre- and post-intervention hand hygiene knowledge quizzes. Training and education on hygiene practices and necessity will help combat RN and PCT knowledge deficits. Questions on infection prevention protocols and expectations can demonstrate valid results as to whether the information provided during training was absorbed and retained. If the visual and verbal cues enable actions during the PDSA cycle, then the evidence should display high quiz scores to prove usefulness and optimization. The second process measure will determine how well the

patient prompting tools helped increase patient confidence to partner as contributors to the cause. Desai et al. (2017), in their QI study, determined it is feasible to use patients as observers to monitor hand hygiene by achieving compliance rates in the 90th percentile. Dependability upon patient participation will be a challenge in the busy PREOP area, while affording patients opportunities to impact the safety of their care and increasing self-empowerment. Allowing open, honest communication between patients and their care providers will enhance authenticity and subsequently assist the RNs and PCTs to be more diligent when it comes to handwashing.

The balancing measure relies on upholding consistent PREOP preparation times for patient readiness to OR. Data accumulated from the electronic health documentation system show the average current PREOP RN preparation time is 35-minutes. The PREOP RNs and PCTs must initiate care measures in an efficient, yet safe, manner to support the OR on-time start metric. Technology allows for increased speed and quality of documentation. Still, according to Bogeskov & Grimshaw-Aagaard (2019), RNs want to find meaning and value in the purpose for entering accurate timeframes. Explaining the worth of keeping the surgical schedule on time for the benefit of the patient and decreasing operation delay costs will help motivate the RNs to record timely PREOP case tracking. Monthly auditing will ensure efficient preparation times and OR start times remain unhindered. See the measurement strategy in Appendix P.

Ethical Considerations

According to the CDC, healthcare professionals clean their hands less than half of the times they should, and HAIs affect one in every 25 patients treated in hospitals (Gould et al., 2017). Observation of hand hygiene practices is subjective data that can be swayed by personal preferences, religious affiliations, and sensitivities to tell the truth. Many healthcare workers believe they already know all there is to know about infection prevention and claim no need for

remediation when it comes to handwashing. Seniority and years of experience of the PREOP RNs and PCTs have not necessarily helped them be more amenable to change behaviors. Old habits seem to serve more as a barrier rather than as a positive influence. Self-rated knowledge and confidence can be overestimated or undervalued, depending on each team member's status, and not inevitably match individuals' actual current understanding and actions (Lutze et al., 2017). Buffet-Bataillon et al. (2010), using direct observation audits, discovered the positive influence of senior healthcare workers serving as effective role models aimed at improving hand hygiene behaviors. Designating senior RNs and PCTs to be project champions will help adopt independence and justice while leading team engagement activities. The American Nurses Association's (2015) Code of Ethics for Nurses with Interpretive Statements Provision 3.4 directs RNs to adhere to policies that promote the health and safety of all patients, ensuring individual accountability for their actions and responsibility to contribute trustworthy patient care. RNs train to be patient advocates, making loyal commitments to their patients to protect treatment environments and the nursing scope of practice (Mason et al., 2016).

First, do no harm, also known in Latin as *primum non nocere*, termed by Thomas Sydenham, emphasizes the daily dilemma healthcare workers face to consciously and unconsciously make decisions to avoid undue hurt (Landry & Miller, 2010). Maintaining proper hand hygiene practices falls within the healthcare worker's control to do their best to not cross-contaminate between patients and to stay ethically competent. Zhao et al. (2018) recommended designing interventions to fit healthcare workers' preferences, current needs, and past experiences, along with emphasizing evidenced-based values to facilitate peer-motivated performances. Sharp et al. (2014) suggested that many patients feel uncomfortable and uninvited to confront healthcare workers about hand hygiene compliance. Empowering patients by

providing simple HAI information will help encourage autonomy and self-motivated control of their wellbeing and foster an engaged partnership to reduce infection (Sharp et al., 2014).

Appealing to unique patient and family shared experiences can be morally inspiring to take the time to consciously slow down and do the little things, such as handwashing, that make lasting impacts. Unfortunately, despite several new automated methods to monitor hand hygiene practices, healthcare facilities' challenges in achieving and maintaining consistently high levels of healthcare workers' hand hygiene compliance have not ceased (Boyce, 2019). The obligation to change the status quo to excite the PREOP RNs and PCTs to participate in the hand hygiene campaign comes from within each individual's uniquely chosen morals and values to sustain life as a healthcare provider. This QI project has been reviewed and approved by the University of San Francisco faculty using QI guidelines and does not require Institutional Review Board approval (see Appendix Q).

Section IV: Results

Outcome Measure Results

PREOP hand hygiene daily compliance, direct observation audits, initially went down at the beginning of the project kickoff in February 2020 to 62%, from a baseline of 69% (see Appendix R). Then compliance reached only 67% in March 2020 during the first two months of PDSA Cycle 1, focusing on training and education of all PREOP RNs and PCTs (see the graph in Appendix S). Therefore the 3-step WHO method by Tschudin-Sutter et al. (2019) was abandoned within the first two months of implementation due to observations of decreased ability to meet the required minimum washing time of at least 20 seconds. The original 6-step WHO method, as outlined within the NCAL KP policy, was then emphasized and held as the official standard for the rest of the project PDSAs. April's direct observation audits finally showed a climb in effort, displaying improved results at 84% (see Appendix T). On May 22, 2020, 16 weeks into the project, the hand hygiene compliance among RNs and PCTs improved to an average of 87%, an 18% increase from baseline (see Appendix U). The quality audits using secret observers showed great success, with 90% compliance for March 2020, 100% for April 2020, and 90% for May 2020, averaging 93% hand hygiene compliance, respectfully (see Appendix V). Combined audits reveal a 13% increase in adherence to WHO standards with an 82% average observance rate for the first four months (see Appendix W). The total SSI odds ratio went down to 1.26, as of April 2020, showing some lessening of SSI diagnoses within the hospital.

The RN and PCT post-quiz scores achieved an average of 85% correct answers. Remediation is required to hit the target of 95%. PDSA Cycle 1-a and additional subsets will continue with subsequent hands-on training and added signage and promptings of WHO

expectations from the NCAL policy. Then, a third required quiz with similar questions will be retaken after at least another month of correct answer-learning reminders. The project team agreed that rushing through the knowledge and understanding part of the campaign was not feasible. Effectively armoring the unit with the power of wisdom will demonstrate the best possible results when it comes to halting infection hazards.

More time is needed to see if elective surgery caseload increases in the next few months as the Shelter in Place for COVID-19 lifts. Also, the staff was a bit resistive and slow to get on board with the initiation of the project. Therefore, the project team has agreed to continue with additional PDSA Cycles 1-b and 1-c by making adjustments to the previous trial and adding just one element at a time in the multimodal plan. PDSA Cycle 1-d incorporated the use of one-on-one training and education for those RNs and PCTs who seemed to be bringing the entire PREOP average compliance scores down every time they worked. Shown in the process map with future state changes in Appendix K, PDSA Cycle 2-a will also help guide the frequency of hand hygiene process steps during the PREOP patient preparation period. A barriers log graph, displayed in Appendix X, shows washing less than 20 seconds, not gelling into the bay, and not gelling out of the bay as the top three most common missed opportunities during daily huddles.

The balancing measure of PREOP RN preparation times had one month of increased average timeframes at 37 minutes in March 2020, but in April and May, the case tracking times went down to 31 and 34 minutes. The goal of 35 minutes or less was met with an average RN patient preparation time of 34 minutes for four months (See Appendix Y). Thus far, the PREOP RN's ability to efficiently prepare a patient for surgery does not seem to be too affected by the extra hand hygiene steps. The new workflow chart of increased hand hygiene opportunities was

just started in May and is still on trial as part of the PDSA Cycle 2. The PDSA Cycle 2 in full force is expected to reach at least the 92% to 95% compliance rate.

PDSA Cycle 3 will start on August 1, 2020. The first 2 PDSAs need more time to gain momentum, hopefully increasing positive habit-forming behaviors to prevent infection. PDSA Cycle 3 includes the introduction of patient participation in the campaign as active contributors. Patient prompting tools will be used to empower patients to share in the fight against infection by helping to remind PREOP staff to wash their hands. Patient involvement will stimulate patient autonomy, while assisting the RNs and PCTs to be vigilant. See patient tools in Appendix Z.

All four measures will continue to be monitored and recorded appropriately to fit the stages of implementation. Daily direct observation audits, along with the monthly quality secret observer audits and the electronic data of average preparation time, will remain until the campaign is fully executed and throughout the sustainability period. The reappearance of the staff quiz will occur after significant reinforcement of the concepts is actualized within the next couple of months. The collection of the patient surveys will happen approximately 90 days after using the prompting tools. The patient participation projected outcome will be favorable towards the 90% self-confidence goal.

Section V: Discussion

Summary

Overall, the results are promising for continued advancements as the project continues to run PDSA cycles until the 99% hand hygiene compliance goal is met and sustained for at least six months. See the summary of all PDSA cycles in Appendix AA. The PREOP RNs' and PCTs' experience throughout the first four months of implementation has been primarily positive with the staff of all different levels of seniority and knowledge, improving comradery by working together to reach a common goal. The PREOP team is gaining momentum to continue the campaign to reach the objectives of increasing hand hygiene compliance, infection prevention knowledge, and patient participation, all while keeping the OR on track with timely preparation times. Following the campaign slogan, "No One Left BeHand," means that every PREOP team member remains diligent in maintaining a culture of safety and speaking up about infection protection for all surgical patients. The PREOP RNs and PCTs do no harm by providing the utmost professionalism, quality, and most importantly, hygienic care for their patients.

The COVID-19 pandemic has affected unanticipated patient care restrictions. Initially, the resulting reduction of surgical caseloads and a reallocation of resources presented itself to be a detriment to the campaign. To the contrary, the advent of the pandemic created a decisive opportunity to strengthen responsiveness and accentuate the importance of infection control and prevention. The PREOP RNs' and PCTs' apprehensiveness became a catalyst for change. In order to achieve the highest desired outcome from this project, the time frame will exceed the original proposal.

Several lessons manifested throughout this project timeline. First, the project leader learned to evaluate successful, high-performing characteristics within clinical microsystems by

using a clinical nurse leader (CNL) approach. Assessing the designated microsystem helps improve awareness and knowledge of how a unit runs daily (Nelson et al., 2007). The 5Ps framework of purpose, patients, professionals, processes, and patterns can be used as a guide to accelerate the collection of relevant information during the unit profile examination (Nelson et al., 2007). Second, the project leader discovered that all multidisciplinary team members are crucial to the change project. Involving all disciplines helps every employee to take the initiative and bring purpose and passion into every hand hygiene opportunity during patient care. Education and training of all staff is key to replacing the status quo and the resistances to change. Improving morale and teamwork are necessary for carrying out a change initiative. Third, safety is always first—safety trumps efficiency. Small steps, using a change theory, help guide the process and keep the team organized. Lastly, a system with consistent patient involvement presents a valuable asset in promoting trust, dependability, and assurance of providers' relationships with their patients to instill safe practices (Lyons, 2007). The assimilation of the evidence and lessons learned from this project can help form new strategies and extensions of the drive to improve healthcare workers' hand hygiene compliance.

Conclusions

Training and education of direct patient care providers is indispensable when it comes to hand hygiene practices and the strategies used to maintain adherence (Martos-Cabrera et al., 2019). Displaying altruistic behaviors to prevent infection and protect patient safety is the foundation for doing no harm and acting in the best interest of and benefit to others (Kelcikova et al., 2019). A multimodal hand hygiene campaign using QI tools over a single intervention has proved a valuable benefit to improving hand hygiene adherence in the PREOP. Using Kotter's theory to link concepts into actions and gain team inspiration and commitment has helped push

through some of the barriers and has created new insights. Enhancing active ownership and surveillance during the campaign necessitates the demand to continue the efforts towards sustainability (Su, 2016). The multidisciplinary champions are leading the change process into fruition one day at a time.

The Hawthorne effect using recognized observers to track hand hygiene opportunities appears to have aided the cause a bit, but not as much as was hoped. The secret observers surprisingly recorded the higher compliance rates, which are good indicators that the interventions are forming good reliable habits. The objective is to have persistent mindfulness and awareness to combat complacency when it comes to making hand hygiene an everyday priority. Once the project is complete, the expectation is to have quarterly check-in meetings with the project champions to assess adherence. Hand hygiene education and hands-on training competencies will now be a part of the PREOP annual skills check-off list for the RNs and PCTs every year. Yousef et al. (2020), using a revised WHO methodology, demonstrated success with consistent and recurrent training and follow-up to safeguard the initiative to retain hand hygiene adherence. The QI tools, interventions, and sustainability plan used in this project can certainly be tailored to combat specific hand hygiene factors causing noncompliance in other units.

The PREOP team needs to work on increasing overall hand hygiene compliance in conjunction with the SSI bundle to have the most significant effect on reducing a patient's risk of SSI. The team leader must inspire multidisciplinary collaboration and teamwork to meet performance metrics and maintain stability (Harris et al., 2018). Serving as an educator, the project leader embraces WHO guidelines to educate the staff on proper hand hygiene techniques and crucial timing. The Code of Ethics for Nurses Provision 7 states the nurse must seek to advance practices in all roles and settings and to continuously inquire and research standards and

policies to benefit the profession and their unique microsystem (American Nurses Association, 2015). The PREOP hand hygiene campaign is a critical piece of the puzzle for infection prevention methods. However, the challenge continues to decrease the risk even further with future endeavors to promote clean healthcare practices. The CNL roles of a system analyst and a risk anticipator are valuable in the project to recognize hazards and to mitigate harm to effectively measure improvements and preserve patient safety (King et al., 2019).

The perioperative director, along with senior leaders, have already been inquiring about the PREOP hand hygiene campaign project and asking for sharing abilities with the rest of the hospital. The promise of organizational leadership engagement and sponsorship will help ensure the PREOP campaign reaches completion and enables their success and failures to benefit other patient care teams. The plan is to first spread the campaign to the PREOP sister unit, the post-anesthesia care unit, with the same successful PDSAs and evidenced-based literature to perform a similar project timeline. HAIs affect not just surgical patient areas but all types of inpatient settings. Mackert et al. (2015) suggested that hand hygiene promotion movements will easily disseminate from unit to unit and within the microsystem, mesosystem, and macrosystem to sustain healthcare workers' devotion and support to the commitment of decreasing HAIs.

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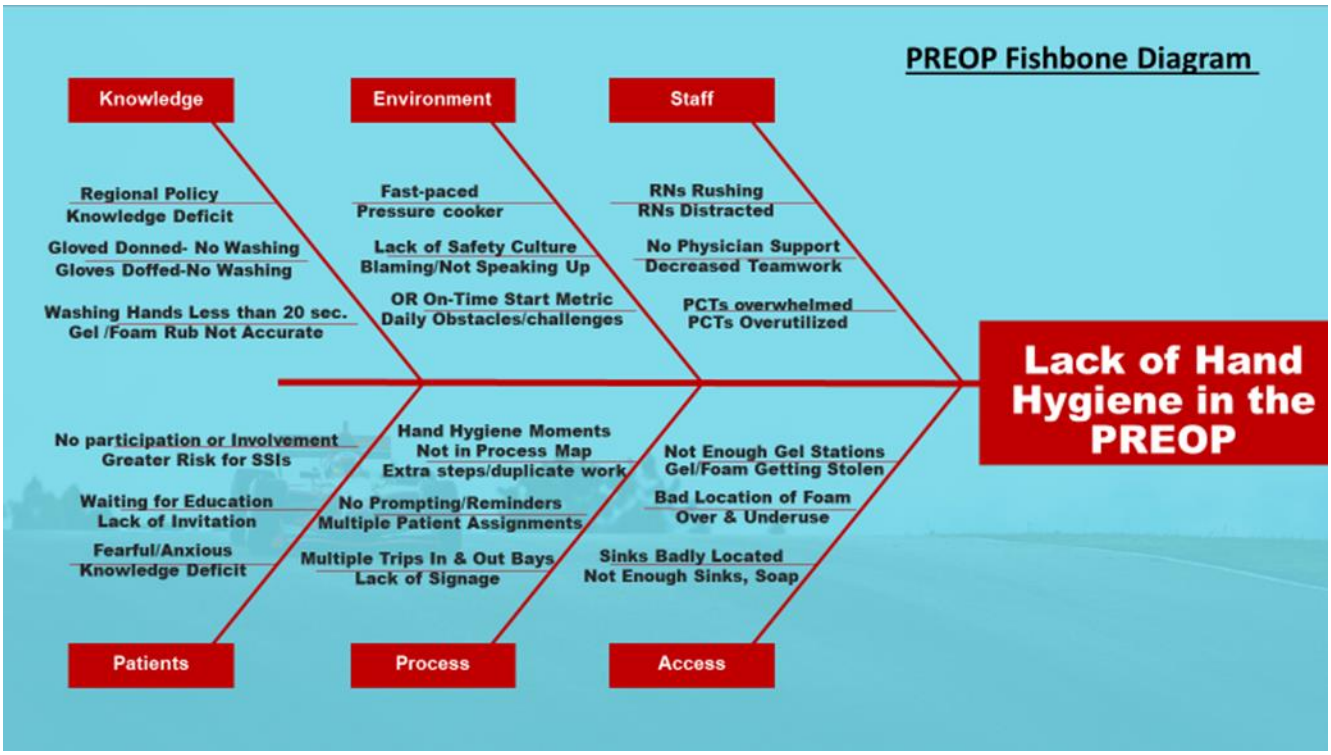
Section VII: Appendices

Appendix A

PREOP Fishbone Diagram



Appendix B

Evaluation Table

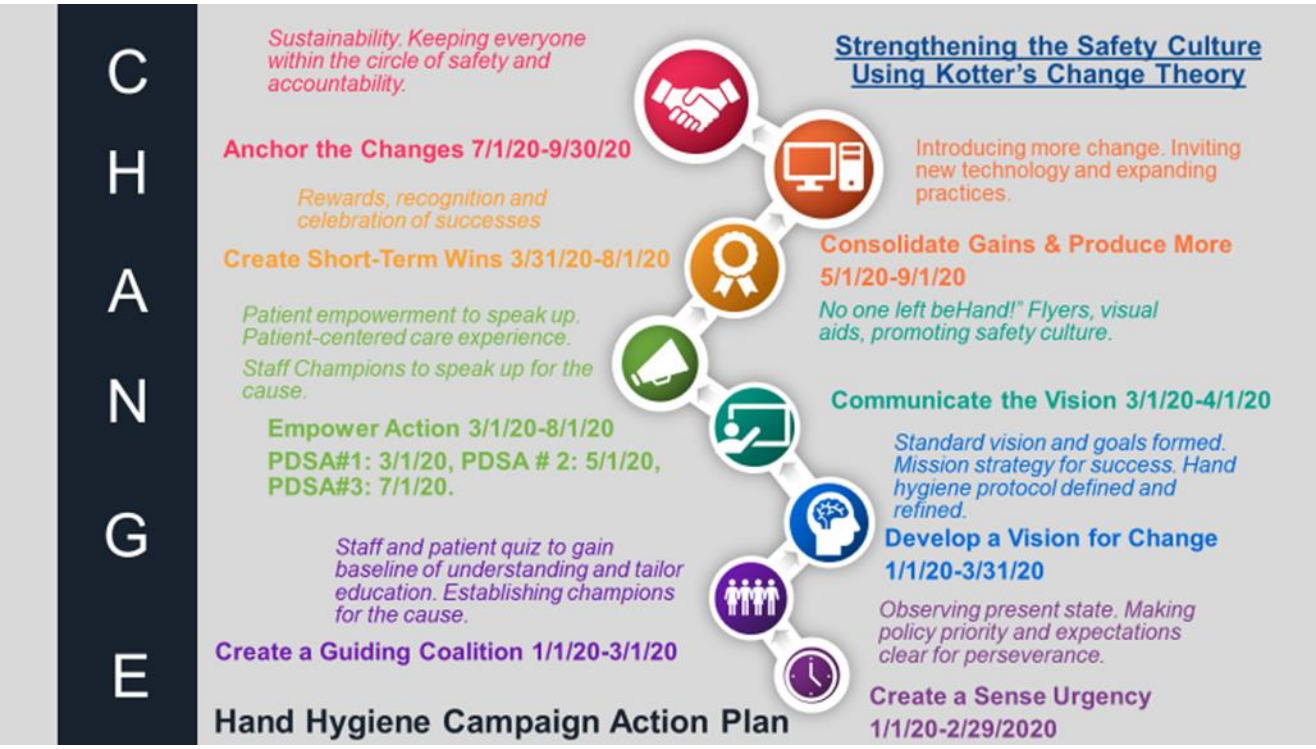
Study	Design	Sample	Outcome/Feasibility	Evidence rating
Tschudin-Sutter et al. (2019)	Cluster-randomized control trial	12 hospital wards with 2,923 hand hygiene observations from Oct. -Nov. 2015	The modified, simpler 3-step compared to the 6-step WHO hand washing technique resulted in higher hand hygiene compliance. Increased from 51.7% to 75.9%. The simpler 3-step technique enhances perceptibility and memorability and helps improve intervention success. Benefits reliability.	JHNEBP Level: IA
Doronina et al. (2017)	Systematic review using PRISMA	6 studies: 3 Randomized Controlled trials, 1 controlled and after study, and 2 interrupted times series.	Combined or multimodal interventions/strategies were more effective than single interventions for greater hand hygiene improvements among nurses. Emphasis on goal setting, reward incentives, and accountability will be valuable in campaign implementation and sustainability.	JHNEBP Level: IIB
Farhoudi et al. (2016)	Quasi-experimental study	1,000 beds in 54 wards within a tertiary academic hospital	Implementation of the WHO multimodal 5 element hand hygiene approach improved hand hygiene compliance from 29.8 to 70.98%. Direct observations using WHO hand hygiene observation forms can be significantly useful to improve nurses' compliance.	JHNEBP Level: IIB
Butenko et al. (2017)	Systematic Review	266 studies from 1990 to May 2015.	Organizational structures enable a partnership between patients and	JHNEBP Level: IIIA

		3 studies were reviewed for qualitative synthesis for findings.	healthcare professionals for hand hygiene compliance. Useful for gaining leadership approval for patient participation in hand hygiene campaign. Benefits the vision for involving patients and keeping caregivers accountable.	
Chassin, Mayer et al. (2015)	Quality Improvement (QI) project: Lean Six Sigma	8 Hospitals	Hand hygiene compliance increased from 47.5% to 81% and sustained for 11 months. Implementation of customized, targeted interventions is useful for hand hygiene improvement efforts.	JHNEBP Level: VA
Chassin, Nether et al. (2015)	Quality Improvement Project: The Targeted Solutions Tool developed by The Joint Commission Center for Transforming Healthcare	19 hospitals for a pilot. 289 Health Care Orgs. for subsequent results.	Average hand hygiene compliance increased from 57.9% to 83.5%. Using Robust Process Improvement tools has proven to be useful in improving hand hygiene compliance, sustaining performance and achieving the spread of interventions.	JHNEBP Level: VA
Phelps and Reed (2016)	Quality Improvement project: PDSA & WHO direct observation	8 hospital units from Feb.-April 2011	Systemwide they achieved > 95% hand hygiene compliance rate and sustained for 22 months. Using the Hawthorne effect helps accelerate culture change. Beneficial for inspiring healthcare team members to speak up and give feedback to contribute.	JHNEBP Level: VA

Alzyood et al. (2018)	Integrative Literature Review	19 Papers represented: 3,400 Patients, 1,174 Families/ Parents, 3,077 HCPs	Providing healthcare professional names and script to the patients increased the patients' willingness to ask the handwashing questions from 25% to 79%. Useful for enabling patient participation, engagement, and shared responsibility for infection control. Benefits patient involvement to contribute to the hand hygiene movement.	JHNEBP Level: VB

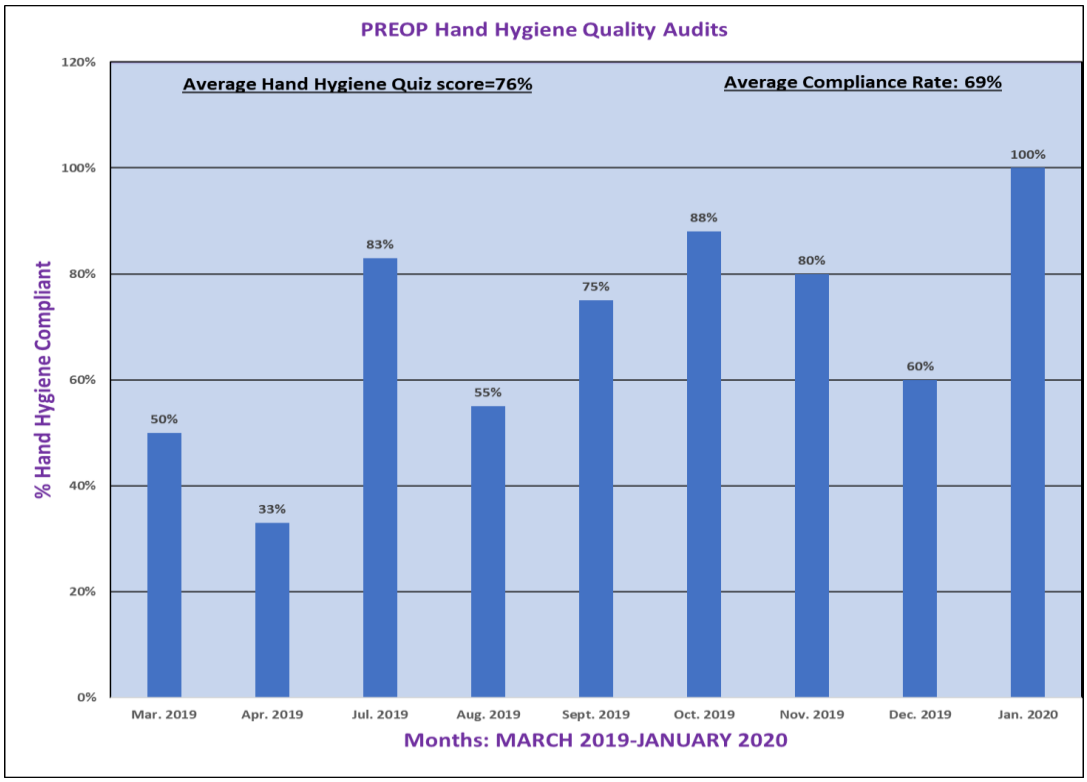
Appendix C

Kotter's Theory Timeline



Appendix D

PREOP Hand Hygiene Quality Audits



Appendix E

PREOP Unit Profile

Appendix E: Inpatient Unit Profile for PREOP

A. Purpose: To prepare patients from surgical and interventional radiology procedures.
Why does your unit exist?

Unit Manager and ANM: P. F. & Keri McCoy	Site Contact: J. J. CNO	Date:1/1/2020-3/1/2020
Administrative Director: J. B.	Nurse Director: R. M.	Medical Director: J. G., MD

B. Know Your Patients: Take a close look into your unit, create a "high-level" picture of the PATIENT POPULATION that you serve. Who are they? What resources do they use? How do the patients view the care they receive?

Est. Age Distribution of Pts:	%
19-50 years	20
51-65 years	30
66-75 years	30
76+ years	20
% of Males	40
% of Females	60

List Your Top 10 Surgical Procedures	
1. Orthopedics-TJ	6.Urology
2.General Surgery	7. Robotic
3.Gynecological	8. Other Otho
Podiatry	9. Plastics
5.Head & Neck	10.Dental
	11. IR

Patient Satisfaction Scores	% Always
Nurses	80
Doctors	90
Environment	60
Pain	70
Discharge % Yes	80
Overall % Excellent	76

Living Situation	%
Married	50
Domestic Partner	25
Live Alone	10
Live with Others	10
Skilled Nursing Facility	2
Nursing Home	2
Homeless	1

Point of Entry	%
Admissions	90
Clinic	0
ED	10
Transfer	0

Pt Population Census: Do these numbers change by season? (Y/N)	Y/N
Pt Census by Hour	Y
Pt Census by Day	Y
Pt Census by Week	Y
Pt Census by Year	Y
30 Day Re-admit Rate	N
Our patients in Other Units	N
Off Service Patients on Our Unit	Y
Frequency of Inability to Admit Pt	Y

Patient Type	LOS avg.	Range
IR	2HRS	1-4HRS
Surgical	4HRS	30M-8HR
Mortality Rate	ZERO IN PACU	

Discharge Disposition	%
Home	85
Home with Visiting Nurse	5
Skilled Nursing Facility	3
Other Hospital	1
Rehab Facility	1
Transfer to ICU	5

****Complete "Through the Eyes of Your Patient," pg 8***

C. Know Your Professionals: Use the following template to create a comprehensive picture of your unit. Who does what and when? Is the right person doing the right activity? Are roles being optimized? Are all roles who contribute to the patient experience listed?

Current Staff	Day FTEs	Evening FTEs	Night FTEs	Weekend FTEs	Over-Time by Role
Surgeon Total	11	2	1	1	Variable
Anesthesia MD Total	12	1	1	1	unknown
Unit Leader Total	2	1	0/ Oncall 1	Oncall 1	Yes-20%
CRNAs Total	4	1	1	1	Variable
RNs Total	9-10	6-7	2 Oncall	2 Oncall	Yes call in
PCTs Total	2	0	0	0	none
PAs Total	2-3	1	1	1	Variable
PTs Total	2	1	o	o	variable
PMTs Total	1	2	0	0	None
Secretaries Total	3	0	0	0	None
Patient Care Coordinators	2	2	1	1	Variable
Social Worker	1	1	1	1	Variable
Lab tech.	2	2	2	2	Variable
Radiology tech.	2	2	2	2	Variable

Admitting Surgical Cases	%
ICU	5
Med/Surg.	60
2 Med-Tele	20
Mother-Baby unit	5
4 Med-Tele	10

Supporting Diagnostic Departments

Physical Therapy, Respiratory Therapists, Lab, Cardiology, Pulmonary, Radiology Technicians, Mammogram, Nuclear Medicine, Hospital-based services, Interventional Radiology, GI dept., Patient Care Coordinators, Social Services, Physician Assistants.

Do you use Per Diems?	___X___Yes	_____NO
Do you use Travelers?	___X___Yes	_____NO
Do you use On-Call Staff?	__X____Yes	_____NO
Do you use a Float Pool?	___X___Yes	_____NO

Staff Satisfaction Scores		%
How stressful is the unit?	% Not Satisfied	60
Would you recommend it as a good place to work?	% Strongly Agree	70
Are you satisfied with the unit morale?	% Not Satisfied	60

***Each staff member should complete the Personal Skills Assessment and "The Activity Survey," pgs 10 - 12**

D. Know Your Processes: How do things get done in the microsystem? Who does what? What are the step-by-step processes? How long does the care process take? Where are the delays? What are the "between" microsystems hand-offs?

<table>
<tr><td colspan="2">1. Create flow charts of routine processes.</td><td colspan="2">Do you use/initiate any of the following?</td><td>Capacity</td><td># Rooms
___44__</td><td># Gurneys__28___</td></tr>
<tr><td colspan="2">a) Preop admission
b) SSI bundle
c) ERAS protocol
d) Recovery of patient
c) Handoff Communications between OR
d) Break Relief Handoffs
e) Discharge process and LOS
f) Transfer to Floor/Admissions
g) Medication Administration
h) Hand-Hygiene practices</td><td colspan="2">Check all that apply Y/N

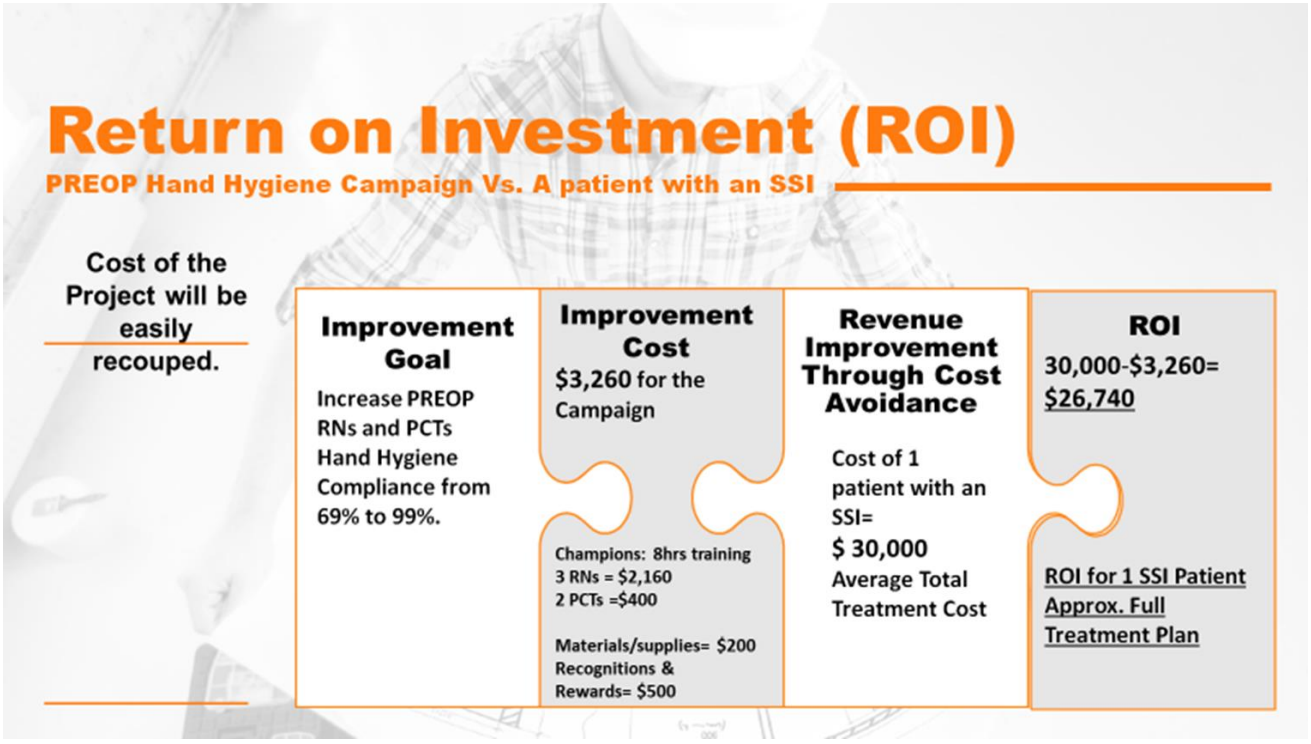
Y Standing Orders/Critical Pathways
Y Rapid Response Team
N Bed Management Rounds
N Multidisciplinary/with Family Rounds
N Midnight Rounds
N Preceptor/Charge Role (RHC yes)
Y Discharge Goals</td><td colspan="3">Big Idea: Need overnight HAS Department
Linking Microsystems
ER, ICU, Med/Surg., GI Dept., Interventional Radiology, L&D,</td></tr>
<tr><td colspan="7">2. Complete the Core and Supporting Process Assessment Tool, pg 14</td></tr>
<tr><td colspan="7">. Know Your Patterns: What patterns are present but not acknowledged in your microsystem? What are the leadership and social patterns? How often does the microsystem meet to discuss patient care? Are patients and families involved? What are your results and outcomes?</td></tr>
<tr><td colspan="2">• Does every member of the unit meet regularly as a team? Yes</td><td colspan="2" rowspan="2">• Do the members of the unit regularly review and discuss safety and reliability issues? Yes, monthly safety meeting, and monthly safety conversations with all employees</td><td colspan="3">• What have you successfully changed? The decrease in total Joint length of stay</td></tr>
<tr><td colspan="2">• How frequently? Daily Huddles and once a month communication team meetings</td><td colspan="3">• What are you most proud of? Same Day-Total Joints discharges
• What is your financial picture? Budget is tight, but the patient demand is increasing so we must purchase new equipment to maintain abilities to provide care for our members.</td></tr>
<tr><td colspan="3">• What is the most significant pattern of variation? Staffing and Number of Surgeries a day, patient satisfaction and staff satisfaction</td><td colspan="4">"Metrics that Matter," See Charts Attached</td></tr>
</table>

Appendix F

SWOT Analysis

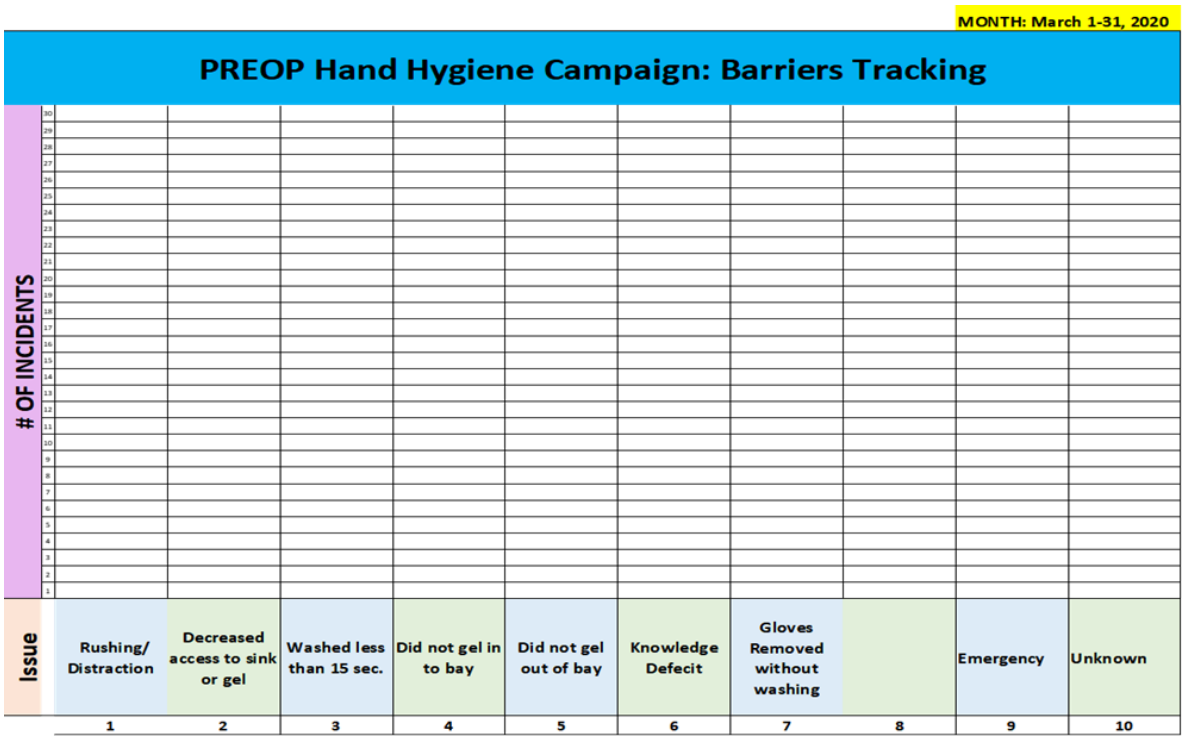
Appendix G

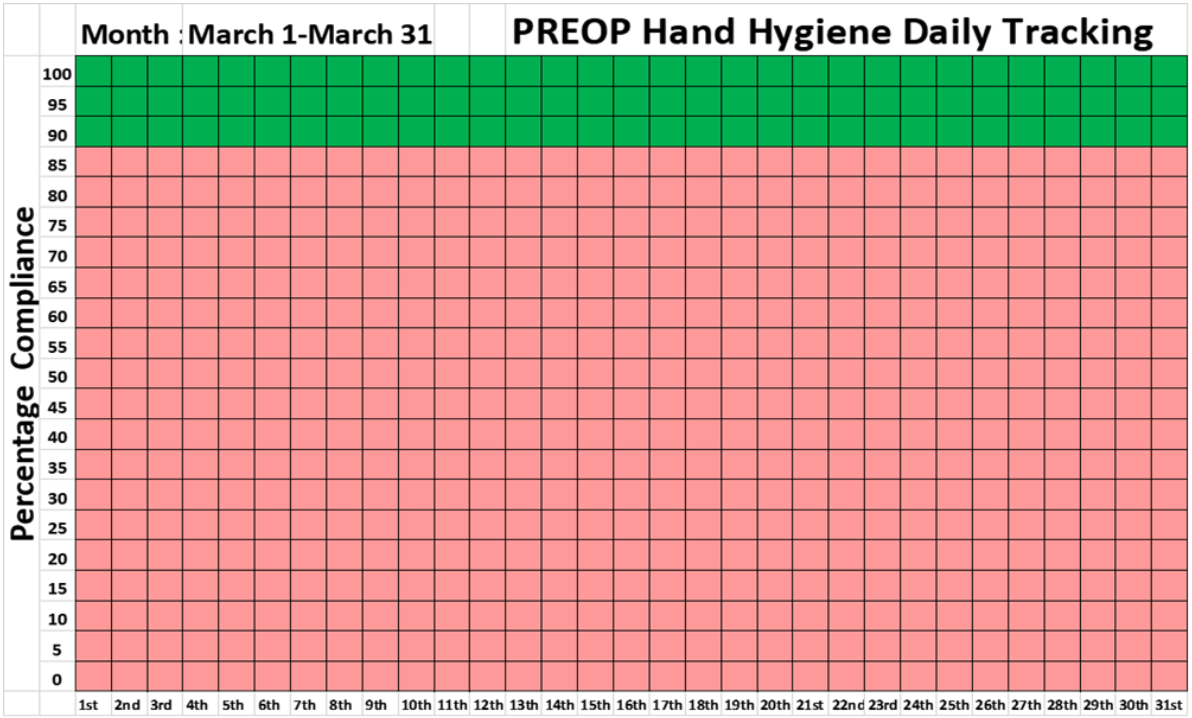
Return on Investment



Appendix H

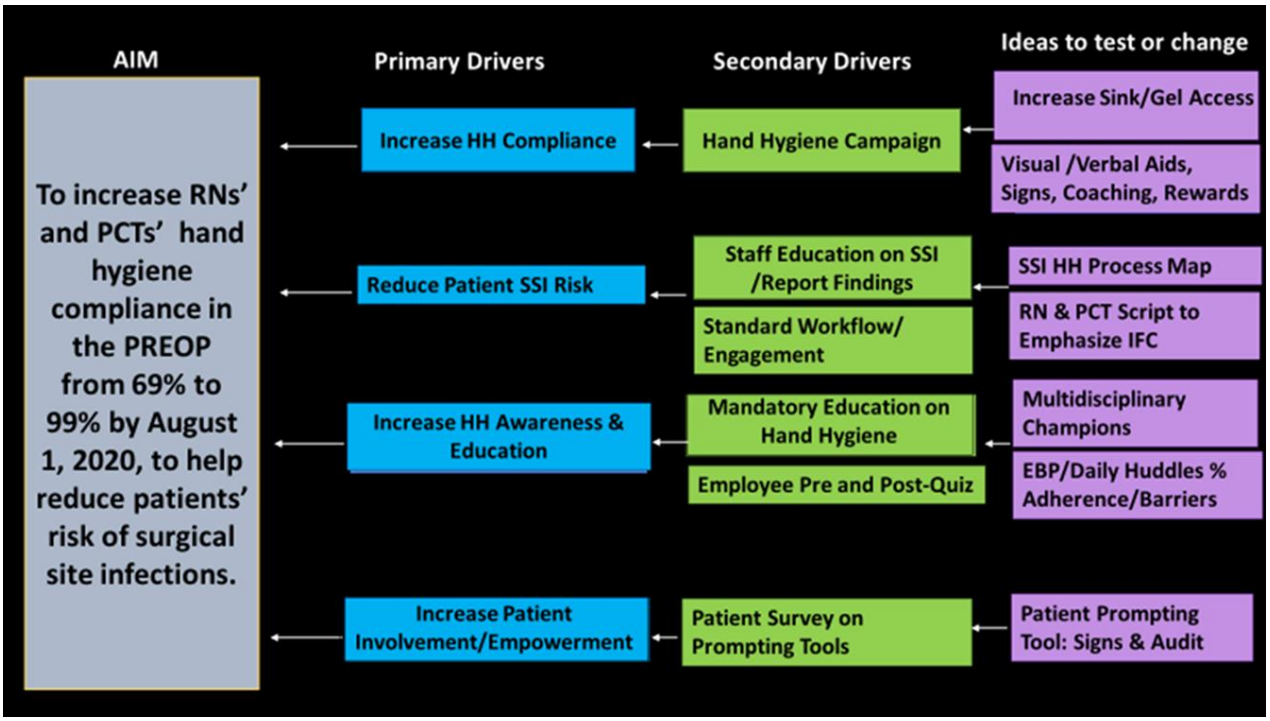
Quality Tools





Appendix I

Driver Diagram



Appendix J

Hand Hygiene Pre-Intervention Quiz

Hand Hygiene Pre-Intervention Quiz

***Please answer all questions to the best of your ability. All answers are anonymous*.**

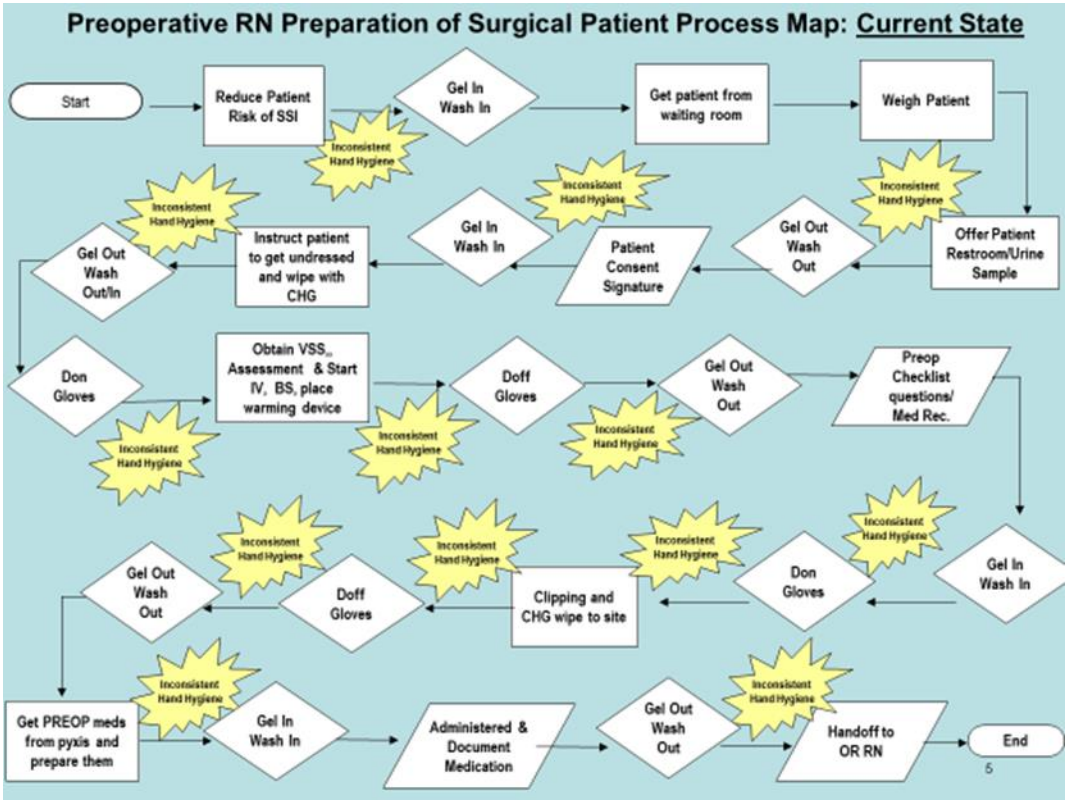
1. When does the World Health Organization recommend hand hygiene?
    a. Before and after touching a patient
    b. After bodily fluid exposure risk & before clean/aseptic procedures
    c. After touching patient surroundings
    d. All of the above
2. True or False: The use of gloves replaces the need for cleaning your hand. (circle one)
3. How many seconds should you rub the alcoholic based gel or foam into your hands?
    a. At least 10 seconds or more
    b. 30-40 seconds
    c. Just until the hands rub dry (Approx. 20 Sec.)
    d. 15 seconds is all you need
4. How many seconds should proper handwashing take?
    a. greater than 45 seconds
    b. 15-30 seconds
    c. 45 seconds
    d. less than 15 seconds
5. What is the best song to sing/hum while washing your hands to ensure the proper amount of time is spent? (circle all that apply)
    a. Happy Birthday Song x2
    b. Alphabet Song x2
    c. Row, Row, Row Your Boat x2
    d. Twinkle, Twinkle, Little Star x2
6. True or False: Hand sanitizers may not be as effective when hands are visibly dirty or greasy.
7. Please circle all that apply: Hand hygiene practices are affected by:
    a. Hygiene station availability such as sinks and dispensers

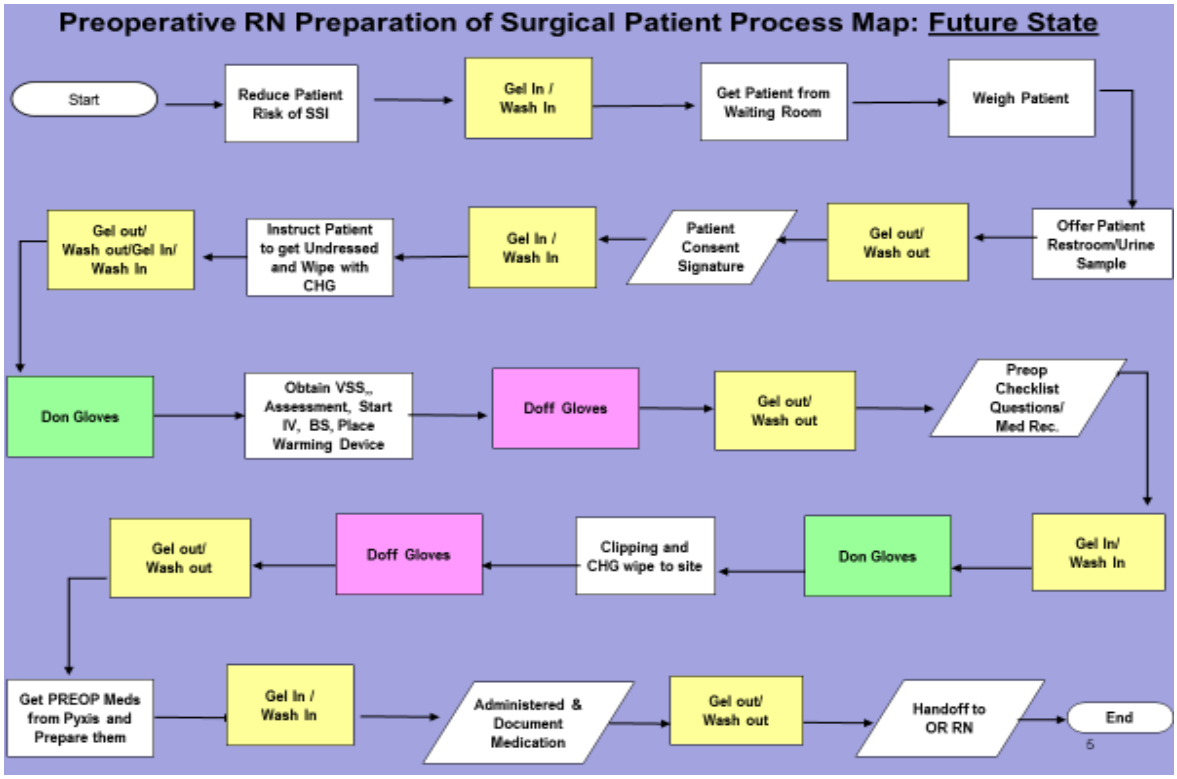
   b. Increased workload
   c. Distractions or rushing
   d. Forgetfulness
   e. Infective or insufficient education

8. What 5 steps does the Centers for Disease Control and Prevention recommend for proper handwashing?
   a. Wet, lather, scrub, rinse, dry
   b. Lather, wet, scrub, rinse, dry
   c. Scrub, rinse, lather, wet, dry
   d. Rinse, lather, wet, scrub, dry
9. Safety culture includes all of the following <u>except:</u>
   a. Staff injury prevention
   b. Patient harm prevention
   c. Speaking up when you see something not right
   d. Blaming and shaming the person who made an error
   e. Advocating for the patients
10. How do you feel when a patient speaks up to you about something they see as incorrect?
   a. It makes me mad
   b. I am thankful for the reminder
   c. I feel confused
   d. I don't like it, but I listen to them

Appendix K

Process Maps




Preoperative RN Preparation of Surgical Patient Process Map: Future State
Start
Reduce Patient Risk of SSI
Gel In / Wash In
Get Patient from Waiting Room
Weigh Patient
Offer Patient Restroom/Urine Sample
Gel out/ Wash out
Patient Consent Signature
Gel In / Wash In
Instruct Patient to get Undressed and Wipe with CHG
Gel out/ Wash out/Gel In/ Wash In
Don Gloves
Obtain VSS,, Assessment, Start IV, BS, Place Warming Device
Doff Gloves
Gel out/ Wash out
Preop Checklist Questions/ Med Rec.
Gel In/ Wash In
Don Gloves
Clipping and CHG wipe to site
Doff Gloves
Gel out/ Wash out
Get PREOP Meds from Pyxis and Prepare them
Gel In / Wash In
Administered & Document Medication
Gel out/ Wash out
Handoff to OR RN
End
5

Appendix L

Project Flyer

Appendix M

Project Timeline

Date/Step	Jan. 1	Mar. 1-Mar. 30	April 1-April 30	May 1-May 31	June 1-June 30	July1-July 31	August 1-Aug. 31	Sustainability Sept. 1-Sept. 30	Spread Oct. 1
Create a Sense of Urgency	Provide the Data/Evidence Current State	Gap Analysis/Scope of Practice							Spread to Other Units
Create a Guiding Coalition	Invite All Staff Members	Multidisciplinary Team Bi-weekly Meetings							Serve as Campaign Sponsor
Develop a Vision for Change	Target State/Aim	Mission/Goals Statements/ charter	Solutions Approach						Coach New Team
Communicate the Vision	HH Team : Bi-weekly Meeting	Campaign Slogan/ Posters, Mascot	Daily Huddles/ Metrics Review	PREOP Process Map					
Empower Action	EBP-Reasons for Actions	PDSA #1/Rapid Experiments/ Serve as Team Leader	Multidisc. Coaches/ Champions	PDSA #2 Update/ Modify Charter		PDSA #3 Finalize Charter		Sustain Actions/ Confirmed State	
Create short-term wins			Goal: 90% Compliance		Recognition/ progress map		Goal: 99% Compliance	Celebrate Successes/ Insights	
Consolidate gains and			Data Review		Goal: 95% Compliance		Completion Plan	Overall Impact Assessment	
Anchor the changes			Abandon the Bad	Remove blocks				Adopt the Change/Policy	

Appendix N

Project Charter

Project Charter: Improving healthcare workers' hand hygiene adherence in the preoperative (PREOP) unit.

Global Aim: To improve PREOP healthcare workers' hand hygiene compliance and decrease the associated patient risk for surgical site infections (SSIs).

Specific Aim: To increase Registered Nurses' (RNs) and Patient Care Technicians' (PCTs) hand hygiene compliance in the PREOP from 69% to 90% by April 1, 2020, 95% by June 1, 2020, and 99% by August 1, 2020, to help reduce patients' risk of surgical site infections.

Background:

Performing hand hygiene is the most effective method of infection control and prevention in reducing healthcare-associated infections (HCAIs), also known as hospital-acquired infections (HAIs) (Tan & Olivo, 2015). The Joint Commission's (TJC) National Patient Safety Goal (NPSG) #7 is to reduce the risk of healthcare-associated infections by complying with the Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO) hand hygiene guidelines (JC, 2019). Surgical Site Infections (SSIs) account for 20% of all HAIs, with 7 to 11 additional postoperative days in the hospital, and a 77% mortality rate (Anderson et al., 2014). Berrios-Torres et al. (2017) emphasize the application of evidence-based antiseptic strategies to help reduce a patient's risk of infection and the costs associated with identified SSIs. The WHO (2020) asserts that effective infection prevention using proper hand hygiene practices decreases HCAIs by at least 30%. Mackert et al. (2015) suggest that hand hygiene promotion movements will easily disseminate from nurse to nurse, unit to unit, within the microsystem, mesosystem, and macrosystem, to sustain healthcare workers' devotion and support to the commitment of decreasing HAIs.

The preoperative (PREOP) unit can significantly contribute to the reduction of SSIs with strict adherence to hand hygiene protocols. Hand hygiene is the single most important first step before performing each of the required SSI regional bundle elements (KP, 2018). Hand hygiene audits from the Quality Department show PREOP at a low average rate of 69% compliance. The Quality Dashboard (KP, n.d.b) displays a significant increase in superficial infections as of October 2019 compared to 2018's overall sum. The Diablo region's annual goal is to have zero reported SSIs. Manager observation audits using Kamishibai cards (a lean methodology tool) to track hand hygiene techniques, timing, and adherence are demonstrating a decrease in conformity. Frequent observations show a lack of handwashing or gel/foam usage in and out of patient bays. Gloves are donned and removed without handwashing performed. RNs and PCTs are rushing from patient to patient, touching patients and their belongings, and handling bodily fluids without performing hand hygiene in between care measures. Initiation of a dynamic, evidence-based, and multidisciplinary PREOP hand hygiene program will help boost adherence to contribute to surgical site infection reduction efforts (Pincock et al., 2012).

Goals: To improve the overall quality, timing, and adherence of hand hygiene protocols in conjunction with the SSI bundle in PREOP.

1. Implementation of a PREOP Hand Hygiene Campaign, "No One Left BeHand."

2. Set Expectations and Standards: Targeted times for hand hygiene opportunities during the World Health Organization's "5 moments of hand hygiene protocol" and SSI bundle tasks in PREOP.
3. Establish a multidisciplinary proactive, teamwork approach to infection control and prevention and patient and staff safety.

Sponsors:

Chief Nursing Officer	J. J.
Director of Perioperative Services	R. M.
Infection Control Officer	T. O.

Measures:

Measure	Data Source	Target
Outcome		
Percentage of RNs' & PCTs' Hand Hygiene Compliance	Daily manager/champion audits and monthly quality "secret observers" audits results	90%, @ 2 month 95% @ 4 months 99% @ 6 months
Process		
Percentage of Staff HH Knowledge	Pencil and paper quiz	98%
Patient Percentage of confidence/helpful signs and prompting tools	Pencil and paper Survey	95%
Balancing		
PREOP preparation of patient turnaround time of 20 minutes (Efficiency-OR start metric)	PREOP RN case tracking of average start to finish of PREOP preparation time	35 minutes or less PREOP patient preparation times (stay at baseline)

Team:

Project Lead	Keri McCoy PREOP ANM
Project Supervisor	P. F. PREOP Manager
RN Champions	D. O., T. G., K. H.
Anesthesia MD Lead champions	Dr. H. & Dr. N.
Surgeon Lead champions	Dr. S. & Dr. G.
PCT Champions	K. J. & M. B.
UA Champions	C. P. & E. R.

Appendix O

WHO Hand Hygiene Observation Form

Observation Form

Facility:		**Period Number*:**		**Session Number*:**	
Service:		**Date:** (dd/mm/yy)	/ /	**Observer:** (initials)	
Ward:		**Start/End time:** (hh:mm)	: / :	**Page N°:**	
Department:		**Session duration:** (mm)		**City**:**	
Country:**					

Prof.cat Code			Prof.cat Code			Prof.cat Code			Prof.cat Code		
N°			N°			N°			N°		
Opp.	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**	**Opp.**	**Indication**	**HH Action**
1	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	1	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	1	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	1	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
2	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	2	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	2	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	2	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
3	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	3	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	3	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	3	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
4	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	4	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	4	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	4	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
5	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	5	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	5	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	5	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
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7	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	7	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	7	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves	7	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW ○ missed ○ gloves
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* To be completed by the data manager.
** **Optional**, to be used if appropriate, according to the local needs and regulations.

Appendix P

Measurement Strategy

Background (Global Aim): Complete the successful implementation of a sustainable hand hygiene campaign to help decrease the risk of SSI for every surgical patient by achieving consistent hand hygiene techniques and timing in all aspects of PREOP patient care.

Population Criteria: All surgical patients who progress through the PREOP to OR.

Data Collection Method: Outcome data will be collected daily for the managers'/champions' hand hygiene audits and monthly from the Quality audits. Process data will be assessed using a before and after quiz and a patient post-tool survey. Balancing data will be collected from electronic health records monthly.

Data Definitions:

Data Element	Data Definition
Quality Hand Hygiene Audits	Percent compliance washing or using gel in and out of bays, after touching bodily fluids, between patients, after removing gloves.
RNs' & PCTs' Hand Hygiene Knowledge Quiz	Assess employees on knowledge of proper hand hygiene practices, timing, and reasons.
Patient Survey	Percent of increased confidence/use of a tool.
PREOP RN Preparation Efficiency	Time it takes an RN to prepare a PREOP patient from start to finish. Case tracking in Health Connect.

Measure Description:

Measure	Measure Definition	Data Collection Source	Goal
Percentage HH compliance	Percent Compliance at 2 months	Quality audits/managers audits	**90%**
Percentage HH compliance	Percent Compliance at 4 months	Quality audits/managers audits	**95%**
Percentage HH compliance	Percent Compliance at 6 months	Quality audits/managers audits	**99%**
# of SSIs	Total # of SSIs for the 6 months	Quality Dashboard	**< 2**
Staff Quiz	Percentage of correct answers	Manager tally of survey results	**98%**
Patient Feedback Survey	Percentage of increased confidence in speaking up/tools helpful	Manager tally survey results	**95%**
PREOP prep times	Time it takes to prepare a patient for surgery	Manager Audits/System Admin.	**35 Minutes or less RN prep time**

Appendix Q

Statement of Non-Research Determination Form

Student Name: Keri McCoy

Title of Project: A Preoperative (PREOP) Hand Hygiene Campaign, "No One Left Behand"

Brief Description of Project: An implementation of a multimodal hand hygiene campaign to increase preoperative registered nurses (RNs) and patient care technicians (PCTs) hand hygiene compliance. The project will use the World Health Organization, Centers for Disease Control and Prevention, and The Joint Commission's guidelines to educate and train healthcare workers appropriate timing, technique, and reasoning for handwashing and gel/foam rub use. Increasing RN and PCT hand hygiene compliance will help reduce patients' risk of surgical site infections (SSIs).

A) Aim Statement: To increase RNs' and PCTs' hand hygiene compliance in the PREOP from 69% to 90% by April 1, 2020, 95% by June 1, 2020, and 99% by August 1, 2020, to help reduce patients' risk of SSIs. .**B) Description of Intervention:** 1. Improving the hand hygiene knowledge deficit of the PREOP team. Pre and post quiz. Training and education on KP policy and World Health Organization (WHO) and Center for Disease Control and Prevention (CDC) recommendations. 2. PREOP process map with hand hygiene moments/frequency in conjunction with SSI bundle elements. Making gel/wash station more accessible. Visual campaign signs and slogans. Scripting for RNs and PCT to use with patients. Daily huddles to track success and barriers using quality improvement tools. Recognition and celebrations. 3. Patient participation and empowerment: prompting tools.

C) How will this intervention change practice? Increasing the knowledge of the RNs and PCTs regarding SSIs and hand hygiene benefits will increase consciousness and awareness to remain diligent in providing safe hand hygiene practices. The project will improve safety/team culture in the PREOP while reducing patients' risk of SSIs. The patients will feel empowered to contribute to their safety and help partner with the healthcare team to increase hand hygiene adherence.

D) Outcome measurements: Outcome Measure: The percentage rate of hand hygiene compliance for the RNs and PCTs in the PREOP. RNs and PCTs will consistently follow the KP regional policy, along with WHO and CDC recommendations for proper hand hygiene. Process Measure: 1. Percentage of staff knowledge on post-quiz. 2. Patient survey percentage of confidence/helpfulness in using the prompting tool. Balancing Measure: PREOP preparation of patient time for OR efficiency on-time start metric. Maintain baseline preparation time of 35 minutes or less.

To qualify as an Evidence-based Change in Practice Project, rather than a Research Project, the criteria outlined in federal guidelines will be used:
(http://answers.hhs.gov/ohrp/categories/1569)

X This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). Student may proceed with implementation.

☐This project involves research with human subjects and must be submitted for IRB approval before project activity can commence.

Comments:

EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST *

Instructions: Answer YES or NO to each of the following statements:

Project Title:	**YES**	**NO**
The aim of the project is to improve the process or delivery of care with established/ accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.	**X**	
The specific aim is to improve performance on a specific service or program and **is a part of usual care**. ALL participants will receive standard of care.	**X**	
The project is **NOT** designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control). The project does **NOT** follow a protocol that overrides clinical decision-making.	**X**	
The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does **NOT** develop paradigms or untested methods or new untested standards.	**X**	
The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does **NOT** seek to test an intervention that is beyond current science and experience.	**X**	
The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF SONHP.	**X**	
The project has **NO** funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	**X**	
The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., **not** a personal research project that is dependent upon the voluntary participation of colleagues, students and/or patients.	**X**	

If there is an intention or possibility of publishing your work, you and the supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: "*This project was undertaken as an Evidence-based change of practice project at X hospital or agency and as such was not formally supervised by the Institutional Review Board."*	**X**	

ANSWER KEY: If the answer to **ALL** of these items is **YES**, the project can be considered an Evidence-based activity that does NOT meet the definition of research. **IRB review is not required. Keep a copy of this checklist in your files.** If the answer to **ANY** of these questions is **NO**, you must submit for IRB approval.

*Adapted with permission of Elizabeth L. Hohmann, MD, Director and Chair, Partners Human Research Committee, Partners Health System, Boston, MA.

STUDENT NAME (Please print): Keri McCoy

_____

Signature of Student:

_____DATE_____

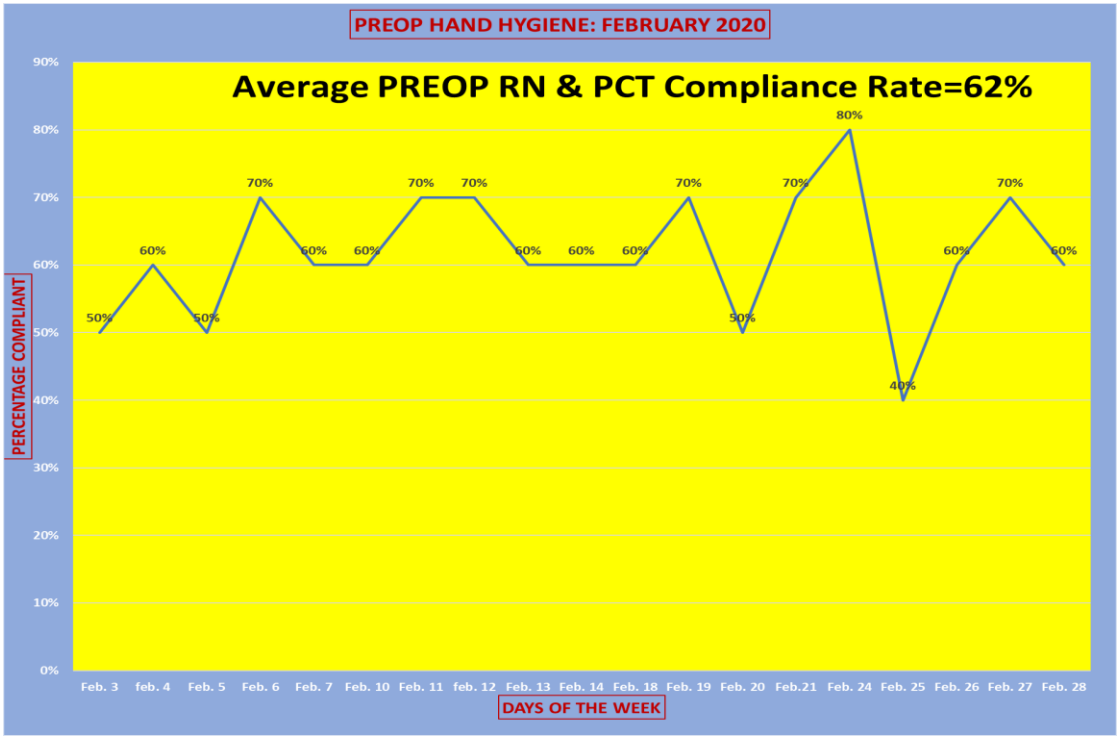
SUPERVISING FACULTY MEMBER NAME (Please print): __

Signature of Supervising Faculty Member

_____DATE_____

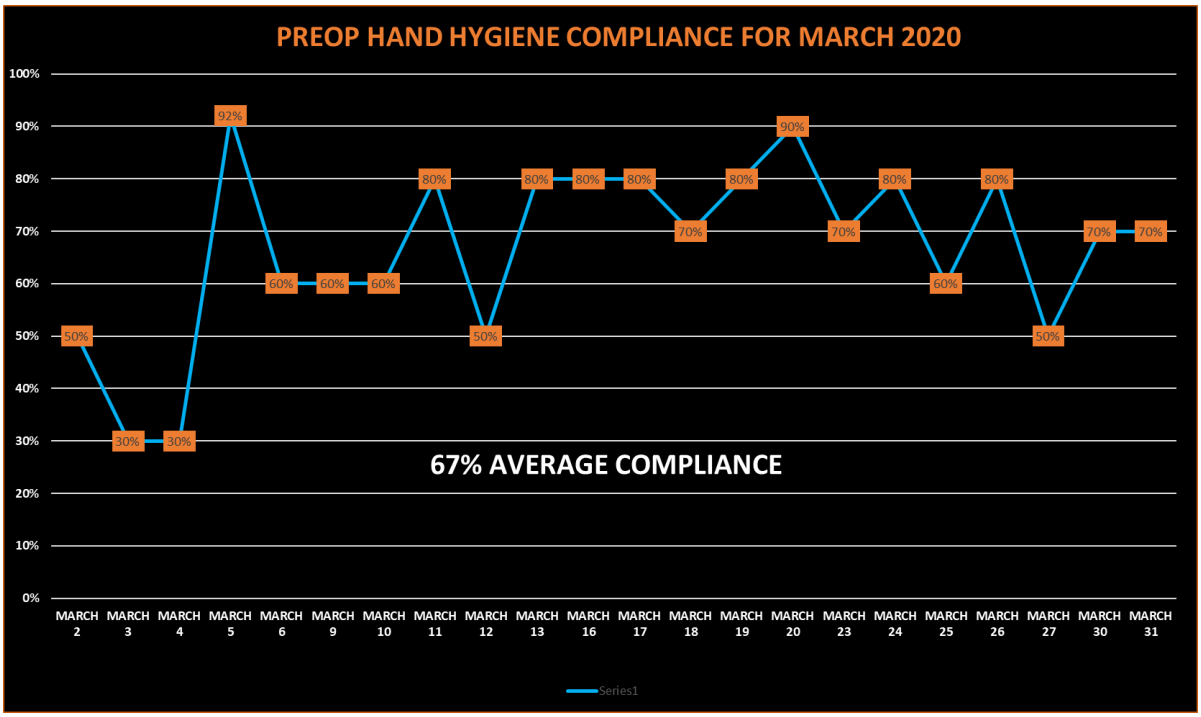
Appendix R

PREOP Hand Hygiene Champion Audits for February



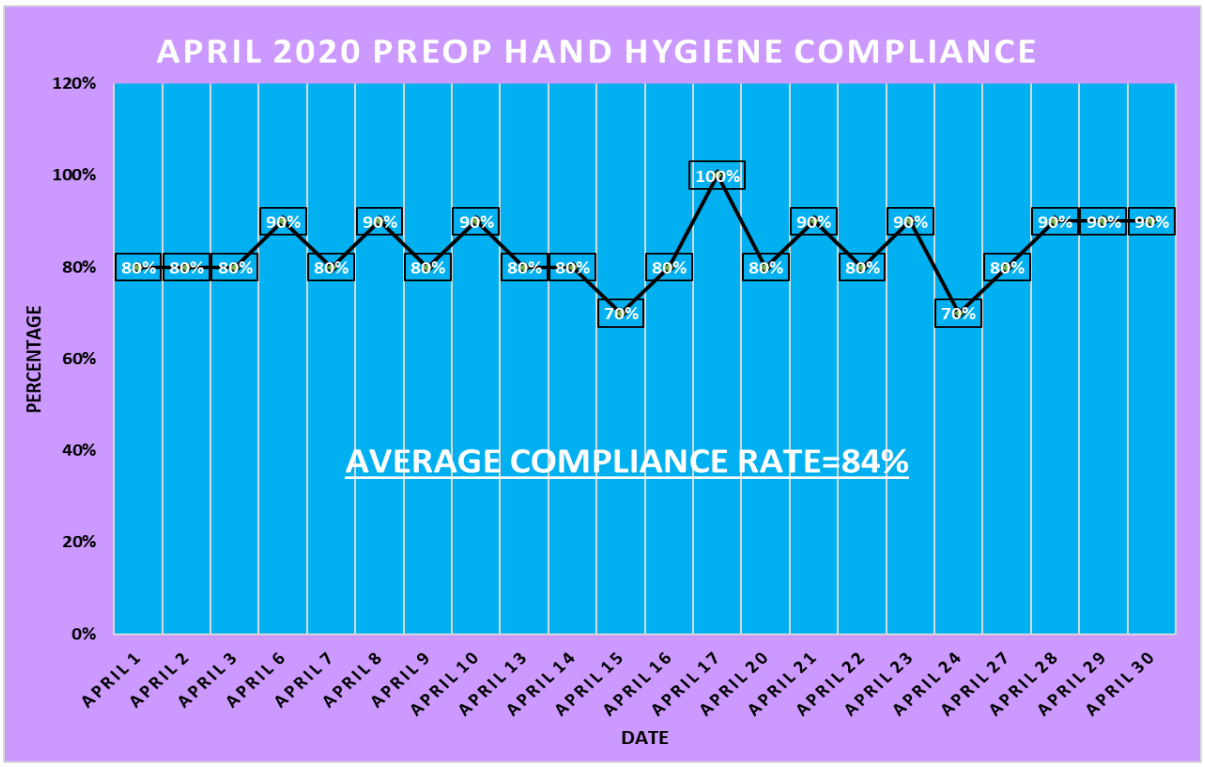
Appendix S

PREOP Hand Hygiene Champion Audits for March



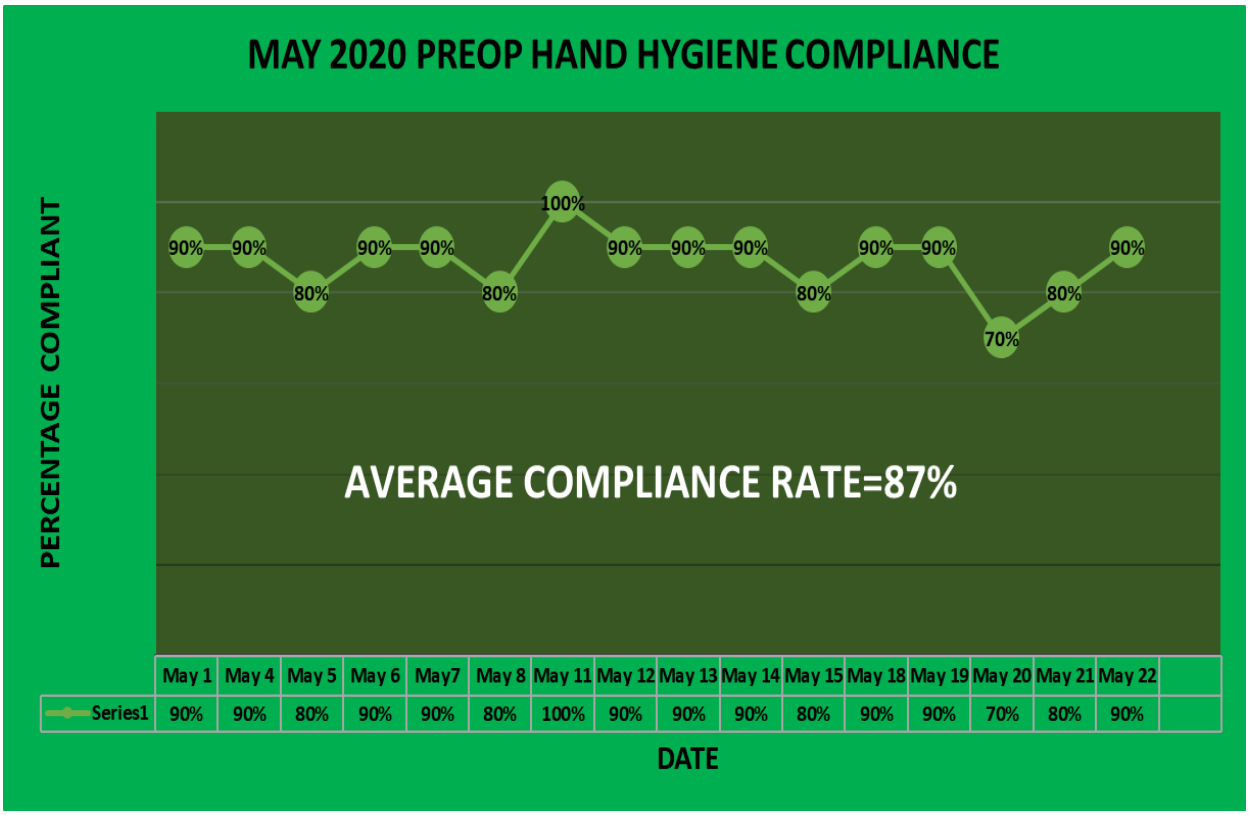
Appendix T

PREOP Hand Hygiene Champion Audits for April



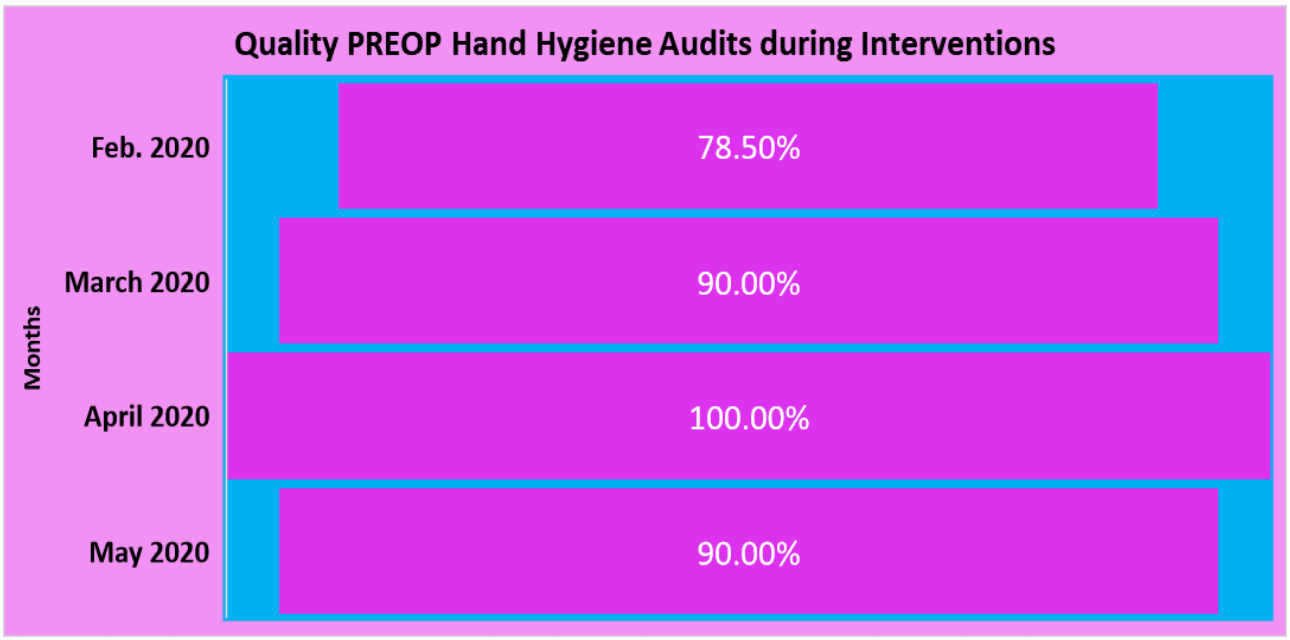
Appendix U

PREOP Hand Hygiene Champion Audits for May



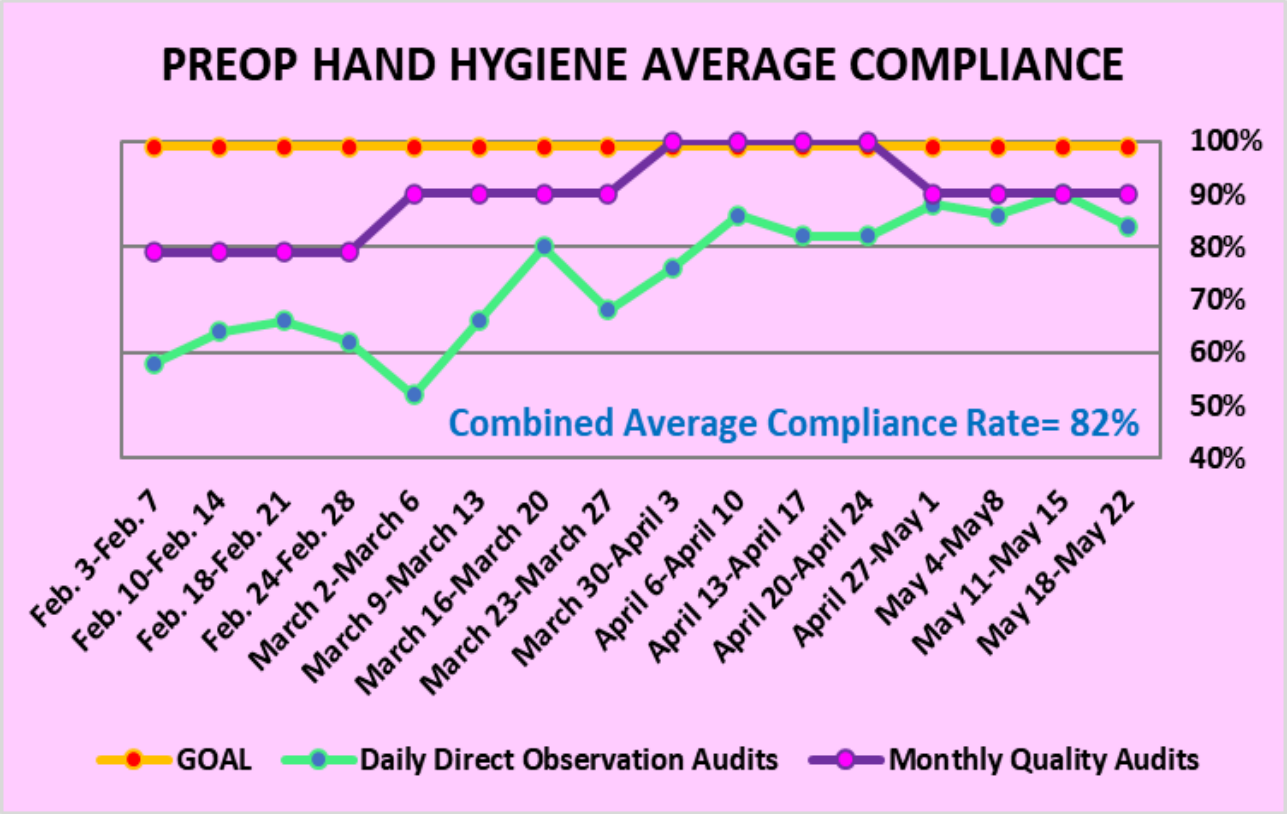
Appendix V

Updated Quality Audits



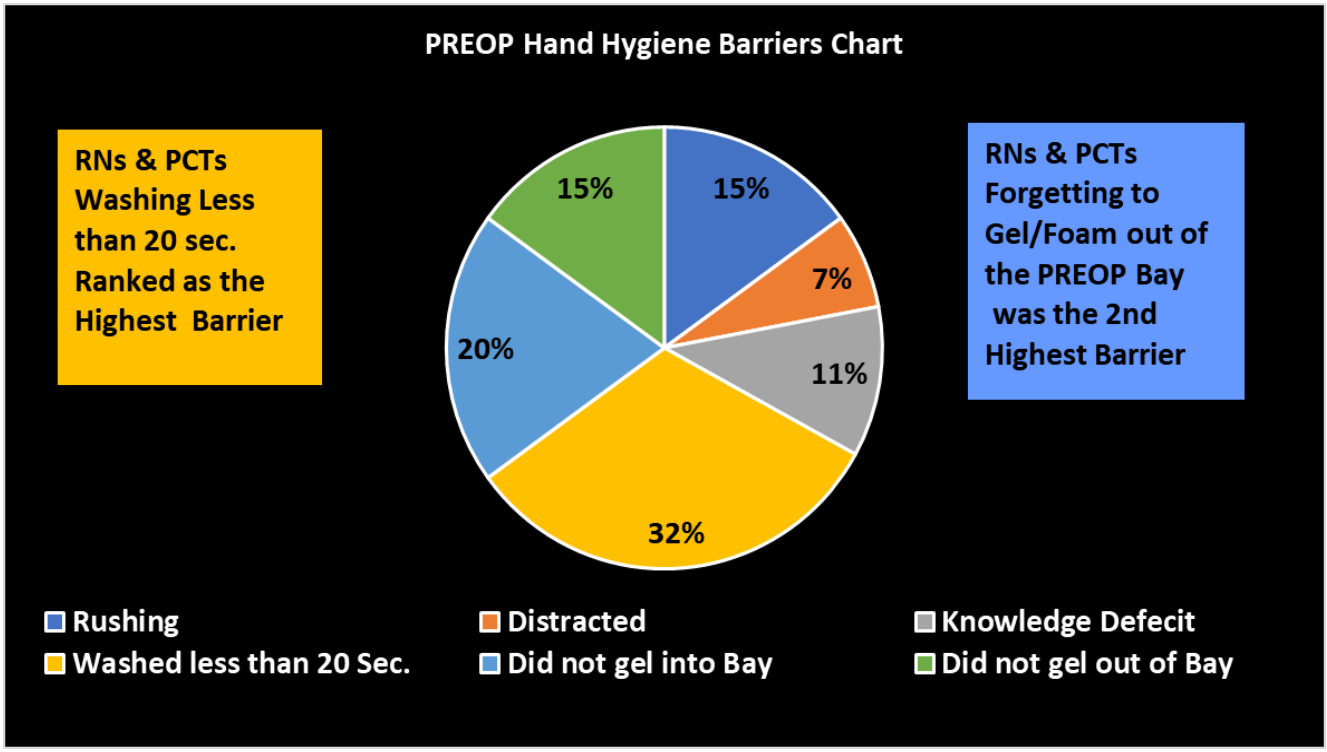
Appendix W

PREOP Hand Hygiene Combined Daily and Monthly Audits



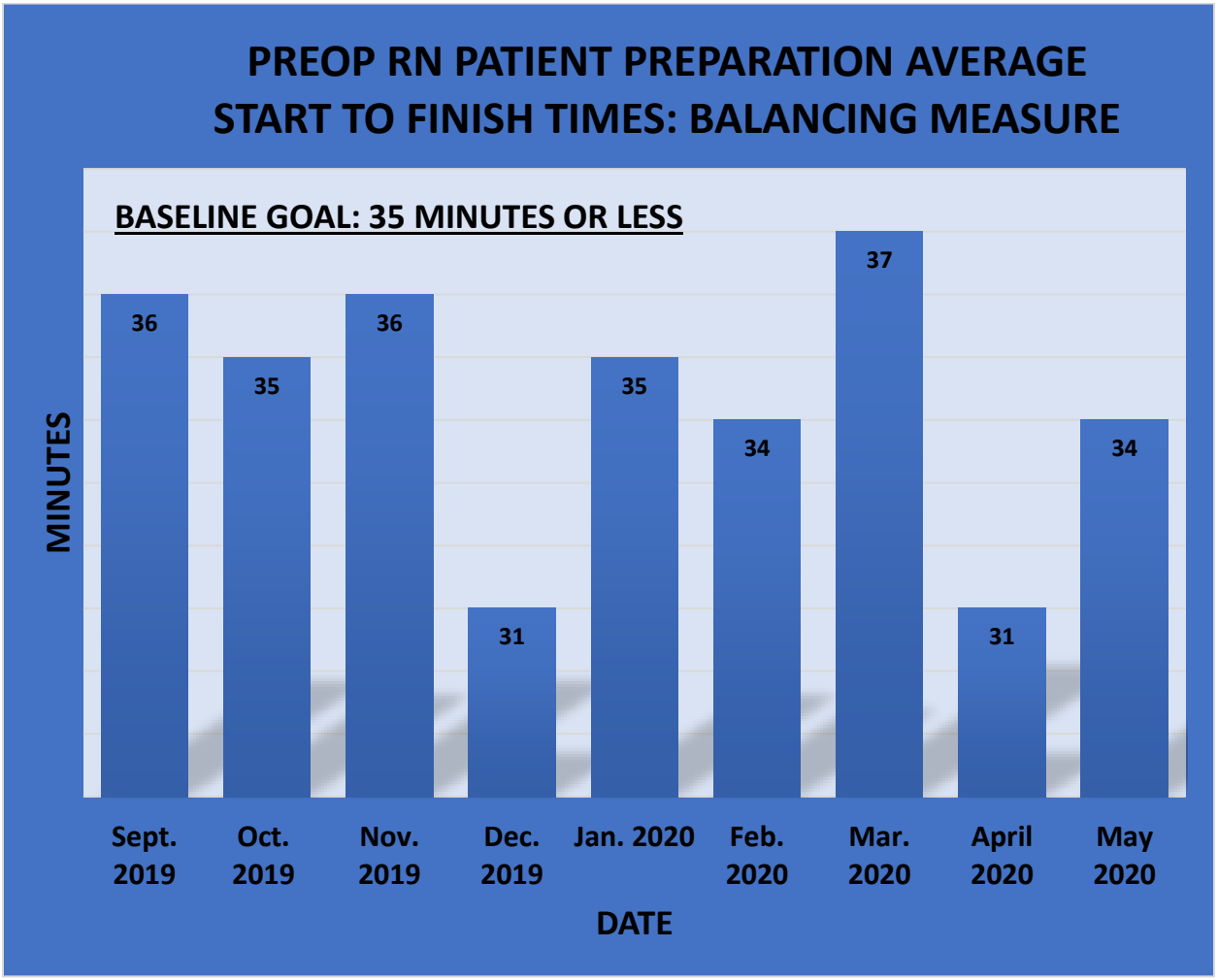
Appendix X

PREOP Hand Hygiene Barriers Chart



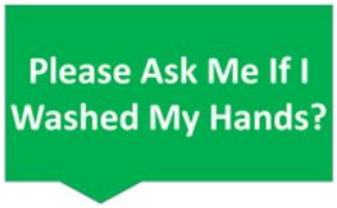
Appendix Y

PREOP RN Patient Preparation Times Graph



Appendix Z

Patient Prompting Tools



Appendix AA

PDSA Cycles