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**Reducing Hospital-Acquired Pneumonia by Educating Patient Care Technicians on
ROUTE Bundle Care Measures**

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NURS-653: CNL Internship

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Abstract

Hospital-acquired pneumonia (HAP) is an infection of the lungs that can lead to severe and sometimes fatal outcomes. HAP can be prevented by oral care interventions, but without proper patient care, treatment can be very expensive. Evidence-proven HAP preventative measures such as the ROUTE bundle and increased patient mobility can significantly lower the risk of pneumonia as well as prevent additional hospital costs. Hospital X is a private nonprofit health care organization in the urban suburbs of a large Northern California city with a current HAP rate of 2.3 and with targeted goals of 2.0. By creating a project that places emphasis on the practice of PCTs (Patient Care Technicians), we can decrease HAP rates and hospital costs while improving patient care and patient outcomes. The first step is contributing to evidentiary research by educating PCTs on the ROUTE bundle and metrics such as toothbrushing and sitting up in a chair.

Keywords: hospital-acquired pneumonia, ROUTE bundle, oral care, toothbrushing, PCTs, education

Section II: Introduction

Hospital-acquired pneumonia (HAP) is a type of pneumonia “that occurs 48 hours or more after admission and did not appear to be incubating at the time of admission” (Klompas, 2022). HAP is an “infection of the lungs that occurs during a hospital stay,” and symptoms can range from mild to severe, sometimes even fatal (*Hospital-acquired pneumonia: MedlinePlus medical encyclopedia*, 2021). HAP includes both non-ventilator hospital-acquired pneumonia (NVHAP) and ventilator-associated pneumonia (VAP) (Baker et al., 2022). Pneumonia is a common illness that is caused by many different germs. HAP can be more severe because the germs that reside in the hospital tend to be more resistant to treatment options. HAP can be spread more easily by health care workers, medical equipment, electronic devices, between patients, and more. Implementing standardized safety measures such as hand washing and wearing gowns can help minimize the spread of HAP. However, the most recent evidence-based practice suggests that preventative measures like providing routine oral care can decrease NVHAP rates by 85% (Kunzmann, 2020).

Oral care is a simple yet effective method that will decrease the overall rate of pneumonia. Tooth brushing can greatly reduce the population of bacteria in the mouth. According to nurse-researcher Dian Baker, Ph.D., professor at California State University, Sacramento, “When patients brush their teeth, they’re basically taking their bacterial count from hundreds of millions down to just a few, and this greatly reduces their risk of pneumonia” (*Fighting pneumonia with a toothbrush*, 2019). Oral care is thus a key intervention in reducing the overall risk of infection. Oral care interventions “have been shown to decrease the incidence of pneumonia in the elderly population and improve quality of life” (Pusins et al., 2018). Other interventions that can prevent these health care-associated infections include hand hygiene,

maintaining a safe and clean environment, screening patients and staff, and following patient safety guidelines (Haque et al., 2020).

The overall goal is to utilize Patient Care Technicians (PCTs) in reducing the overall risk of pneumonia in patients by emphasizing the importance of oral care and the utilization of the ROUTE bundle. PCTs are frontline workers considered to be the backbone of healthcare. PCTs spend a significant amount of one-on-one time with the patients and therefore are able to perform tooth and mouth cleaning measures. The ROUTE bundle is an active intervention that is used throughout the hospital, but unfortunately, due to a structural lack of information disclosure, many staff members are either unaware of the ROUTE bundle or do not understand what it is. The ROUTE bundle is an acronym that stands for Respiratory care/Reduce sedation, Oral care, Up, Tube care and Education. With proper care and protocols, this process aims to have patients recover more quickly, be discharged sooner, and prevent infections like pneumonia.

The nurse's role in this quality improvement project is to provide the vision for the project and secure “the necessary resources to ensure that the organization’s quality improvement efforts are successful” through creating a safe space for open communication while supporting quality care standards (Moran & Johnson, 1992). For change to occur, it is important that healthcare staff such as nurses work together with clinical nurse leaders (CNL). A CNL is “charged with ensuring high-quality patient healthcare through evidence-based practice, streamlined healthcare delivery models, and the latest industry innovations” (*Clinical nurse leader role and responsibilities*, 2021). Specific to this project, the CNL can help keep track of past, current, and future pneumonia rates, as well as assess and educate the PCTs and collaborate with the interdisciplinary team to execute the change.

Problem Description

Hospital X has measures put in place to prevent HAP, yet there has still been an increase in the HAP rate. There is a discrepancy between the processes included in the ROUTE bundle and the interventions being carried out by PCTs. This project worked to promote staff education using the resources that were already set in place to improve the overall knowledge regarding HAP, emphasizing the nursing and PCT interventions, which can prevent this type of illness.

This quality improvement project takes place in a Northern California Hospital. Hospital X has seven main units that are covered throughout the seven hospital floors. Each unit has a similar layout and has the same protocols set in place to prevent HAP. The protocols include the use of the ROUTE bundle, PCT checklist, education and documentation. At Hospital X, there is a current HAP rate of 2.3. The number of HAPs are defined by diagnosis and chest imaging results at least 48 hours after admission per 1000 admissions (DeLara & Mostasisa, 2022). This rate was calculated by dividing the overall number of individuals that contacted HAP with the overall number of patients in the hospital. 20 patients were diagnosed with HAP out of a total of 8,795 patients, which concludes to the overall HAP rate of 2.3 (DeLara & Mostasisa, 2022). Teeth brushing performance metrics showed a 68.7% completion, compared to the average region of 72.8% (DeLara & Mostasisa, 2022). The target goal is 2 with a current gap to goal of -3. In comparison to other northern hospitals, Hospital X is in the middle region of the curve with the lowest value at 2 and the highest value at 4. Some contributing factors include the effects of the pandemic, recognition, staffing, education and accountability (DeLara & Mostasisa, 2022).

The ROUTE (Respiratory care/Reduced sedation, Oral care, Up, Tube care, Education) bundle is the current method used by Hospital X to prevent HAP (Appendix A). The ROUTE

bundle is a prevention bundle that comprises 7 interventions including “aggressive mobilization, upright posture for meals, swallowing evaluation before feeding, sedation restriction, elevated head of bed, oral care and feeding tube care” (Gupta, 2019). The overall goal of the ROUTE bundle is to decrease the incidence of HAP. A study using the ROUTE bundle between 2012 and 2018 showed the reduction of HAP in Northern California hospitals. HAP decreased from 5.92 to 1.79 per 1000 admissions and 24.57 to 6.49 per 100,000 members (Gupta, 2019). Hospital X implemented the ROUTE bundle in order to reduce their overall HAP rate. Some barriers found when reviewing the ROUTE bundle protocol at Hospital X included improper documentation, lack of staffing or lack of knowledge about the ROUTE bundle, therefore ROUTE bundle education was implemented.

Available Knowledge

The PICOT statement used for the research articles and data collection for this quality improvement project interrogates that: for patients bed bound for 48 hours or more, does education of the ROUTE bundle to Patient Care Technicians (PCTs) with an emphasis on oral care decrease Hospital-Acquired Pneumonia (HAP) rates compared to the existing preventative protocol? The central question here can be answered by directing the PCT’s to information and resources about the ROUTE bundle, increasing awareness of the HAP oral care protocol in order to offset higher cases. This will allow the health care system to ascertain the effective ways that PCT’s can become trained/knowledgeable of the HAP oral care protocol.

We are contributing to research through a quality improvement project about PCTs that explores how they can reduce HAP rates by providing tooth brushing and mouth cleaning. PCTs can emphasize the effects of oral care and how certain tools like the ROUTE bundle are helpful in decreasing the overall HAP rate. A literature search was organized to review the existing

evidence surrounding oral care in reducing HAP rates. The databases were searched by using keywords such as: *oral care, tooth brushing, HAP, ROUTE bundle, PCTs, non-ventilator hospital-acquired pneumonia bed bound, protocol, interventions, prevention, documentation, and quality outcome*. There are seven articles that were chosen based on their connection to reducing HAP through oral care.

Even though the latest data shows a decrease in many healthcare-associated infections, recent publications highlight the rising numbers of NV-HAP (Quinn et al., 2020). Hospitalized patients are at particular risk for aspirating microorganisms within the oral cavity into the lung (Stepinski et al., 2022). Researchers have found a crucial link between oral microflora and HAP (Quinn et al., 2020). The first step to consider is reducing the pathogenic colonization of the oropharyngeal cavity. If oral care is not done within the first 48 hours of hospitalization, changes in the oral microbiota can occur and lead to virulent pneumonia-causing organisms (Quinn et al., 2020). Respiratory pathogens like *Staphylococcus aureus* and *Pseudomonas aeruginosa* “contribute to inoculation of virulent organisms into the lungs, even in healthy adults without obvious risk factors” (Quinn et al., 2020). There was a high prevalence of respiratory virus infection found with patients with HAP, therefore it is necessary to implement preventative care and treatment of these respiratory viruses (Torres-Garcia et al., 2019).

According to various articles, aspiration and bacteria are the main causes of pneumonia. An article written by Anita Rae Modi, MD and Christopher S. Kovacs, MD focuses on the diagnosis, management, and prevention of HAP and VAP. The authors state that regular oral care and the treatment of dysphagia are key features in preventing “oropharyngeal colonization of pathogenic organisms, aspiration, and ensuing HAP or VAP” (Modi & Kovacs, 2020). This article also reports that several institutions worldwide reduced their pneumonia incidence by

implementing and utilizing bundles, which included an oral care component like tooth brushing (Modi & Kovacs, 2020). Another strategy this article focuses on is reducing aspiration risk by elevating the head of the bed to more than 30 degrees. Prevention is critical to reduce morbidity and mortality related to these nosocomial infections. Key preventative measures include hand hygiene, use of masks to reduce the spread of respiratory pathogens, and cleaning shared equipment.

Even though prevention is a large part of decreasing HAP rates, there are some factors that cannot be changed. Socio-demographic factors such as age, sex, comorbidity and economic status can affect the chances of an individual acquiring HAP (Kim et al., 2022). Other factors that are related to the incidence of HAP include clinical factors and hospital environmental factors. Examples of clinical factors include positioning care, medical vs. surgical patients, and mechanical ventilation (Kim et al., 2022). Hospital environmental factors include bed-to-nurse ratio and the type of hospital room (Kim et al., 2022). Overall, this study focuses on the different factors that can lead to HAP. The study showed the “incidence of HAP over 3 years was 5.0%, and older age, male sex, asthma, COPD, other chronic lower respiratory diseases, CKD and poverty were associated with the incidence of HAP” (Kim et al., 2022). This retrospective cohort study showed that the incidence of HAP was associated with various sociodemographic, clinical, and hospital environmental factors.

A nurse's approach to reducing HAP consists of elevating the head of the bed, oral hygiene, patient mobility, coughing and deep breathing. This quality improvement project is unique because it is a nurse-driven oral care protocol to reduce HAP. The close proximity of nurses to patients allows them to work with the PCTs to provide better overall care. The purpose of this evidence-based quality improvement paper was to “implement an oral care protocol in the

adult in-patient areas of a level 1 trauma hospital and to evaluate its impact on the incidence of HAP” (Warren et al., 2019). The study focuses on introducing a new suction toothbrush kit for at-risk patients and proper documentation of the oral care intervention by the nursing staff into the electronic medical record. Another study conducted by Michael Klompas supports that providing daily oral care by toothbrushing significantly can lower the pneumonia rate and decrease the duration of one’s hospital stay. This article focused on providing oral care but without the use of chlorhexidine. Chlorhexidine is an antiseptic and disinfectant that helps reduce the number of germs in the mouth or on the skin (*Chlorhexidine*, 2021). However, the study used meta-analysis of randomized trials and observational studies to allow for the possibility that oral care with chlorhexidine may increase mortality rates (Klompas et al., 2022).

Moreover, documentation is important when tracking data. For example, if a nurse or PCT provides oral care, but it is not properly documented, then by looking at the electronic medical record the data would show that oral care was not implemented. *A Nurse-Driven Oral Care Protocol to Reduce Hospital-Acquired Pneumonia*, showed us that proper documentation led to positive results with “an average adherence to protocol of 76% as evidenced by oral care documentation and supply use” (Warren et al., 2019). Overall, the nursing staff improved the pneumonia outcomes by implementing oral care interventions, which reduced the length of stay, patient mortality and hospital costs.

Change Theory

The Deliberative Nursing Process was used as the conceptual framework, which guided this quality improvement project. The nursing process functions as a systematic guide to patient centered care with 5 steps: assessment, diagnosis, planning, implementation and evaluation (Toney-Butler & Thayer, 2022). During the assessment phase, Hospital X identified the problem

of an increased rate in HAP. The data was analyzed from the past three years and an audit was conducted. To assess the baseline data, the hospital staff were surveyed to provide additional input. Data trends were analyzed using Excel spreadsheets and the electronic health record helped populate the data. The planning phase included working with the PCTs and CNLs to raise awareness to the staff of the rising HAP rate. It is important to emphasize that there is a problem with HAP rates and work with the staff to discuss information like the data trends, pre/post-survey results and interventions. The implementation phase heavily consisted of educating both staff and patients. ROUTE bundle flyers were printed and handed out to remind the PCTs to implement oral care and other related interventions. During the evaluation phase, the PCTs and nursing staff were educated about the importance of providing oral care to decrease pneumonia rates but unfortunately, we do not have any current data that can support our project goal. The Deliberative Nursing Process will create a set of tools for implementing change and providing the best and most effective patient care.

Specific Aim

The specific aim for this quality improvement project is to improve the number of HAP by utilizing PCTs to implement the use of the existing oral care protocol, the ROUTE bundle, throughout all the units at Hospital X. By looking at Hospital X's HAP report, we can see an upwards trend that starts in September 2019 and continues to the present data, which shows the current HAP rate of 2.3. The target rate for HAP is 2, which is why this quality improvement project is a high-priority project for Hospital X. Patients in the hospital are often very sick and cannot fight off germs; many studies have found that HAP is associated with an increased risk of death, which is why the prevention of HAP is so crucial. Given the prevalence and significant

impact of HAP on patient outcomes, early preventative strategies and interventions to reduce HAP should be a priority.

Section III: Methods

Context

Oral hygiene care has been shown to improve the rate of pneumonia and helps decrease the bacteria count in the mouth. Simple measures such as toothbrushing, mouthwash, tube care, sitting upright and ambulation were implemented within these microsystems and our expected results will show a decrease in the overall HAP rate. This quality improvement project took place at Hospital X and covered floors three, four, six and seven on the medical surgical and ICU units. The 5 Whys and fishbone diagrams were used to identify any obstacles and to figure out what caused the increasing HAP rate. A fishbone diagram, as seen in Appendix B was created to help “identify possible causes of a problem” (*How to use the fishbone tool for root cause analysis*, n.d.). The main concerns for the increasing levels of HAP rate in Hospital X was due to a lack of communication, lack of defined protocol, lack of documentation, lack of training or knowledge and lack of staff. The 5 Whys diagram helps the quality team visualize step by step what the problem statement is and what the barriers are (see Appendix C). Many tools like the SWOT analysis, PDSA cycle, Gantt chart and a cost-benefit analysis were used to describe the context of this project.

SWOT Analysis

A SWOT analysis is a framework for identifying and analyzing strengths, weaknesses, opportunities and threats (see Appendix D). The main strength of this project is that the data provided was gathered by the hospital and the quality team. The hospital, quality team and nursing staff including the PCTs were in support of preventing HAP and improving patient

outcomes. The ROUTE bundle is another strength to this project because it is something that Hospital X already has access to. Implementing education to the PCTs is another strength of this project. The primary weakness of this quality improvement project was the lack of time to provide an extensive data analysis of the overall project. There was not enough time for the quality team to do an in-depth review of the gathered material. Through evidenced-based research and data gathering, we can come to the conclusion that the HAP rate should decrease.

To improve the quality of this study, it is important to apply a needs assessment. A needs assessment is “a systemic process that examines what criteria must be met in order to reach a desired outcome” (Contributor, 2019). A needs assessment focuses on addressing the needs or gaps to provide a solution. In this quality improvement project, the needs assessment revealed a lack of awareness of the ROUTE bundle and the components that make up the bundle. Increasing the level of education is also an opportunity for better patient care outcomes. The threats of this project include the lack of utilization of the ROUTE bundle by the PCT’s and the limited time constraints that interfered with additional interventions being applied.

PDSA Cycle

A plan-do-study-act (PDSA) cycle was developed to help carry out changes (see Appendix E). The plan phase consisted of conducting a literature review to identify key elements and interventions that prevent the development of HAP. An environmental survey of the various hospital units was conducted to assess the use of the ROUTE bundle by the PCTs. A pre-survey was created as seen in Appendix F, which helps assess a baseline of PCT knowledge about the ROUTE bundle, HAP preventative interventions and oral care protocols. During the do phase, data was gathered and presented at various staff meetings and the implementation idea was presented to stakeholders.

Education is the priority intervention that is used in this project, so it's key that we educate the PCT's on the ROUTE bundle. Also, a single page flyer (ROUTE bundle) was designed to help PCTs, and other staff members remember and implement the components that make up the bundle. The flyer was given to PCT's, nursing staff, unit clerks, managers, and leadership professionals. The study stage consisted of conducting a post-survey to the PCT's to test their overall understanding. It's important to assess the knowledge of the PCTs and analyze any deficiencies on the floor that prevent proper implementation. The act phase focuses on revising the quality improvement project based on the findings and communicating with the stakeholders to improve the overall HAP rates throughout the hospital.

Gantt Chart

A Gantt chart (seen in Appendix G) was utilized to keep the quality improvement project organized and create a timeline for milestone activities. The Gantt chart is based on the PDSA cycle. This project started in September of 2022 and finished towards the end of November of 2022.

Cost-Benefit Analysis

A key component of this project is the implementation of a cost-benefit analysis. A cost-benefit analysis is important because it shows us if the costs and benefits are worth the intervention. As for Hospital X, the average HAP rate of 2.3 patients per month occurred during June 2021 to May 2022. HAP is a very costly infection, a single person with HAP can cost the hospital upwards to \$80,000 (Stergiopoulos et al., 2017). California spends about \$3.1 billion each year on hospital-acquired infections, which is why prevention and education are critical (*Hospital safety and quality care*, 2022). By reviewing relevant research studies, we can

conclude that by educating the staff in oral care protocols and other pneumonia preventative measures, then the HAP rate will decrease.

In this project, the overall costs were mainly directed towards educating PCT's, which was cost-efficient. The education process included a one-paged printed flyer that explained the components that make up the ROUTE bundle. Some individuals like management received HAP packets that consisted of the one-paged ROUTE bundle flyer, fishbone diagram, 5 Whys document and the PDSA cycle. A total of roughly 150 copies were printed that were utilized for this study. The total costs of paper, ink, and printing was less than \$25. Hospital X's goal for this quality improvement project is to reduce the rate of HAP to 2 patients per month or less. If the goal is achieved, this will save Hospital X thousands of dollars.

Interventions

An article written by Grant Zwicke states that "staff education is one of the most important things a hospital can do" (Zwicke, 2022). Educating staff members like PCT's can lead to better patient care and help retain staff members. Zwicke explains that not only are patients happier, but staff members tend to also be happier and more productive (Zwicke, 2022). Education is the main intervention that was performed in this quality improvement project. A pre-survey questionnaire was executed to see where each PCT's knowledge was regarding the ROUTE bundle.

Education depended on the knowledge level of each PCT. For example, if a PCT had no familiarity with the ROUTE bundle, then they would receive more one-on-one time to review the bundle. If a PCT was actively using the bundle and knew what interventions helped reduce the HAP rate, then they would receive less ROUTE bundle education. Every PCT regardless of prior knowledge was educated on the ROUTE bundle and interventions that decrease the HAP rate,

including oral care and mobility. As we educated each PCT, we also gave them a one-page ROUTE bundle flyer as a reminder to utilize the bundle when taking care of patients in order to reduce HAP rates. In addition, it is important to remind PCT's to properly chart oral care in the electronic medical record, so Hospital X is not getting marked for improper documentation regarding pneumonia care. PCTs need to remember to provide oral care after every meal and at least perform this measure twice a day. PCTs are also responsible for documenting all oral care methods and reinforcing the necessity of receiving oral care to patients.

Study of the Interventions

The study of the intervention for this quality project was done on a weekly and monthly basis. To determine the effectiveness of educating PCTs, a post-survey was used to assess staff understanding regarding the ROUTE bundle. The post-survey questions are used to determine if the PCTs are understanding and implementing the interventions that make up the ROUTE bundle. The post-survey consisted of only three questions: what does the acronym ROUTE stand for, where do you document oral care, and where is the PCT checklist located? The goal of the project is to educate PCTs on the ROUTE bundle in order to reduce the overall HAP rate.

Measures of Interventions

When studying the intervention, we used the post-survey questions to see if our education measures were successful. Due to insufficient time, we only had the opportunity to post-survey four PCTs. After the surveys, it was concluded that 3 out of 4 PCTs still did not know what ROUTE stood for but did know of the interventions that made up ROUTE. All four of the PCTs knew where to document oral care and 3 out of 4 PCTs knew where to locate the PCT checklist. By reviewing these results, further education needs to continue if we want to reach our targeted HAP rate goals.

Section IV: Results

Changes were not expected at this time because there were only a few months at Hospital X. This is the beginning phase of this quality improvement project, and it is important that the next clinical group continues implementing this project to create further change and improve the HAP rates. Providing ROUTE bundle education to the PCTs helps the staff provide preventative care measures in order to minimize the risks of pneumonia and improve patient care. PCTs are frontline workers and spend the most one-on-one time with the patients, so it is important to engage and educate the PCTs to reach our desired results. The data regarding HAP rates will be collected and will be available in the quarterly reports. After the initial education process, PCTs are expected PCTs to know what the ROUTE bundle is, the interventions that make up the bundle and reinforce the importance of oral care.

Since this project is in its beginning phases, there were some interventions that were not implemented. For instance, after discussing the addition of a toothbrush on a patient's meal tray, 76% of PCTs agreed that working with nutrition to place a toothbrush on the patient's meal tray is not a practical solution. The main reason PCTs disapproved of this intervention was that patients have expressed to the PCTs that they do not want to look or think of brushing their teeth while eating a meal. The PCTs also stated that they want to be able to gather oral care supplies whenever needed. This suggestion was not utilized in this project since it was rejected by both PCT and patient.

The most significant barrier that 84% of PCTs stated was due to the lack of staffing at Hospital X. Majority of the PCTs felt that a better staffing ratio would lead to more successful attempts for oral care. One PCT and nurse lead both stated that the core issue is not lack of staffing but a lack of teamwork. The PCT and nurse both claimed that the floor staff could

complete all patient care tasks but only if they all work together. In addition, a unit clerk on the 7th floor presented a quality issue with the toothbrush, toothpaste and mouthwash. She stated that the structure of the toothbrushes is weak and that the tooth bristles fall apart easily. The unit clerk also said that “the toothpaste and mouthwash have a terrible taste,” which is why 36% of PCTs believe patients are refusing oral care (K. Doe, personal communication, October 4, 2022).

Only 16% of PCTs believe that patient education is necessary for oral care measures, while 36% of PCTs stated that teamwork and collaboration from all staff members will help increase oral care interventions. After reviewing the post-survey results, 75% of PCTs still did not know what the ROUTE bundle stood for or what interventions made up the bundle. The quality team needs to adjust the education approach and strategies so more PCTs can retain the knowledge and utilize the ROUTE bundle to improve patient care and decrease HAP rates. The effects of this quality improvement project’s results raise more awareness around HAP prevention and a need for more extensive PCT education training regarding the ROUTE bundle and the utilization of the PCT checklist. PCTs are expected to implement the ROUTE bundle and PCT checklist to effectively decrease the HAP rate to 2.0 or less.

Section V: Discussion

Hospital-acquired pneumonia is a major problem that affects the health of patients and leads to extensive costs for the hospital. As healthcare staff, it is key that we provide the best and safest patient centered care. By working on this quality improvement project, a few critical findings were discovered.

Lessons learned

During the initial assessment, it became apparent that most PCTs did not know what a ROUTE bundle was or what the acronym stood for. Even though the PCTs were not aware of the

ROUTE bundle, some individuals did know of the interventions that made up the bundle. This shows that the ROUTE bundle is not being used or implemented throughout Hospital X. After talking to the PCTs, it also became apparent that the PCT checklist was not being utilized by some individuals. Some PCTs stated they did not know about the checklist, did not know where to find it or thought the checklist felt redundant since PCTs must chart on the electronic medical record. Some PCTs were more knowledgeable about the checklist and ROUTE bundle compared to other PCTs because every unit focuses on different priorities. Some PCTs felt that they were doing more work than others. Two PCTs stated that the core issue is not lack of staffing, but a lack of team effort. They concluded that the floor staff could complete all the tasks only if they worked together. For instance, if a nurse is available, then that individual can answer call light tasks for the PCT and vice versa.

As healthcare workers, it is important to remember that we are a team and have a common goal to provide effective, efficient and safe care to all patients. Even though some PCTs stated their opinion that the lack of teamwork was the biggest problem, the majority of the PCTs stated that the staffing issue was the most important factor. The PCTs can provide oral care measures like tooth brushing or mouthwash but a major factor that prevents oral care from being implemented multiple times a day is due to lack of staffing. A common statement made by PCTs after discussing strategies on how to decrease the HAP rate was their lack of “manpower”. There are only one or two PCTs on each floor and sometimes one individual PCT can have up to 20 patients. There is not enough time in the PCTs shift to be able to implement tooth brushing measures multiple times. I believe adding a few more PCTs to each floor can help the PCTs manage all the patient care responsibilities including oral care.

Another problem that was found while working on this quality improvement project was concerning PCT documentation errors on the electronic medical record. For example, a PCT provided oral care on a patient who did not have teeth, so that PCT did not document in the electronic medical record that tooth brushing was completed. It is important to explain to staff that it does not matter if the patient does not have teeth or uses dentures instead, the goal of oral care measures like tooth brushing or mouthwash is to decrease the overall bacteria count in the mouth. Some recommendations that can be contributed to make this project successful include educating PCTs and other nursing staff on the importance of utilizing the ROUTE bundle, hiring more PCTs, emphasizing the importance of proper documentation into the electronic medical record, and working with the supply chain on buying better quality toothbrushes, toothpaste and mouthwash.

Conclusion

As mentioned earlier in the paper, evidence shows that oral care, tube care, the use of the incentive spirometry, early ambulation, sitting upright and education work together in the prevention of HAP. A study conducted by the Veterans Affairs (VA) implemented a project that aims to ensure that nurses brush patients' teeth twice a day (Munro, 2019). The VA researched, developed and implemented this Project HAPPEN (Hospital-Acquired Pneumonia Prevention by Engaging Nurses to provide oral care), which decreased HAP rates by 92% in the initial pilot program, saved \$9.4 million and most importantly saved a predicted 42 lives (Munro, 2019). Many VA medical centers have implemented this program throughout the United States, Canada, United Kingdom and more.

The study is important because it clearly states that simple preventative measures like tooth brushing can save millions of dollars and keep patients healthy. Similar studies like the VA

project suggest and show that oral preventative measures are helpful in preventing HAP and decreasing overall healthcare associated costs. Unfortunately, there is little research that focuses on educating PCTs, which it is important to change the focus from nurse to PCT. PCTs are an important part of the chain in healthcare and can assist in many nursing care responsibilities like providing oral care. Directing the focus to PCTs provides more opportunities for oral care to be implemented multiple times a day.

Even though this quality improvement project is in its beginning stages, it is still showing signs of overall HAP improvement. Evidence shows that educating the PCTs will help in decreasing the overall HAP rate at Hospital X. The ROUTE bundle and PCT checklist serve as important interventions in documenting and implementing HAP preventative care. Implementing this quality improvement project with other Hospital X associated hospitals will create an opportunity for hospital-wide support and engagement. It is expected that this project will create awareness by educating the PCTs about the utilization of the ROUTE bundle and the PCT checklist.

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Section VII: Appendices

Appendix A: ROUTE Bundle Flyer


ROUTE BUNDLE

Together, Lets Decrease Hospital Acquired Pnumonia!


R: Respiratory Care/Reduced Sedaifion
Incentive Spirometry (10 breaths every 2 hours while awake)




O: Oral Care
Supervised or assisted oral care 2x a day with a soft toothbrush
Chlorhexidine rinse (2x a day unless restricted)




U: Up
Walking minimum 20 feet 2x a day
Up for meals
Head of bed up 30 degrees



T: Tube Care
Check feeding tube position after each feeding
Reassess NGT need daily
Check tube patency

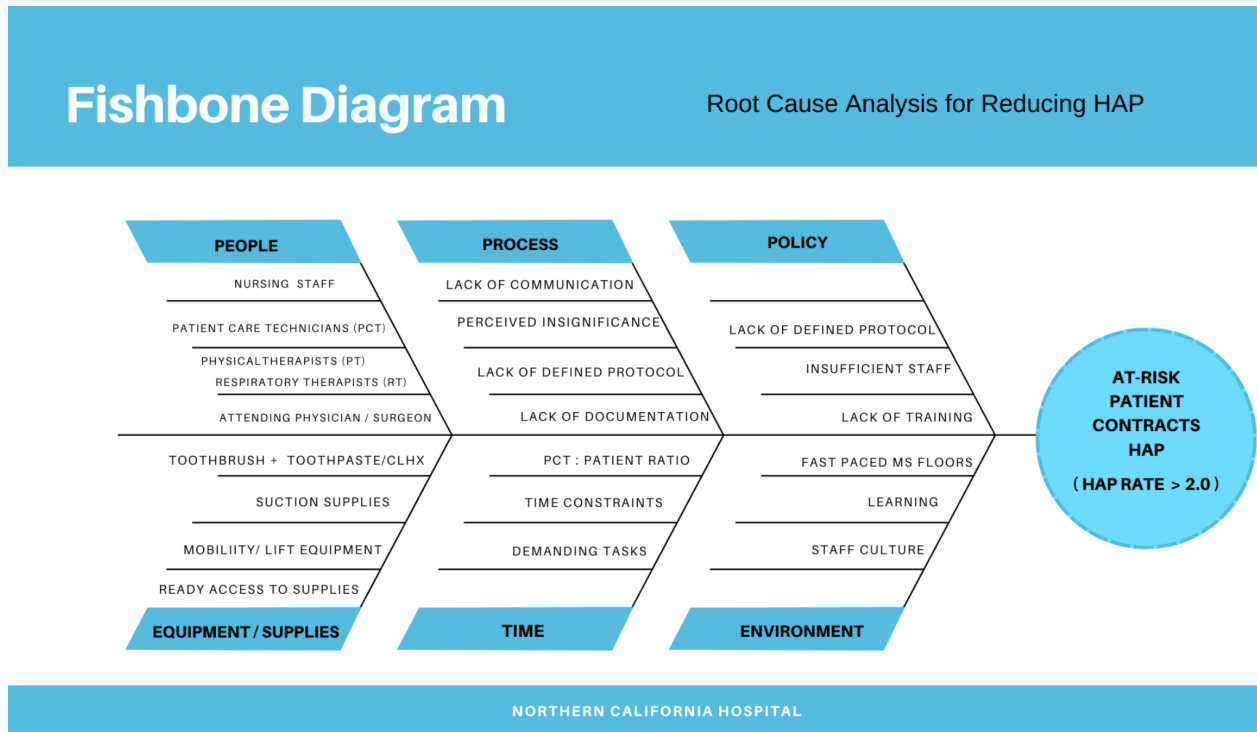


E: Education
Educate and engage patients and family on Inceptive spirometry use, oral care, and positioning

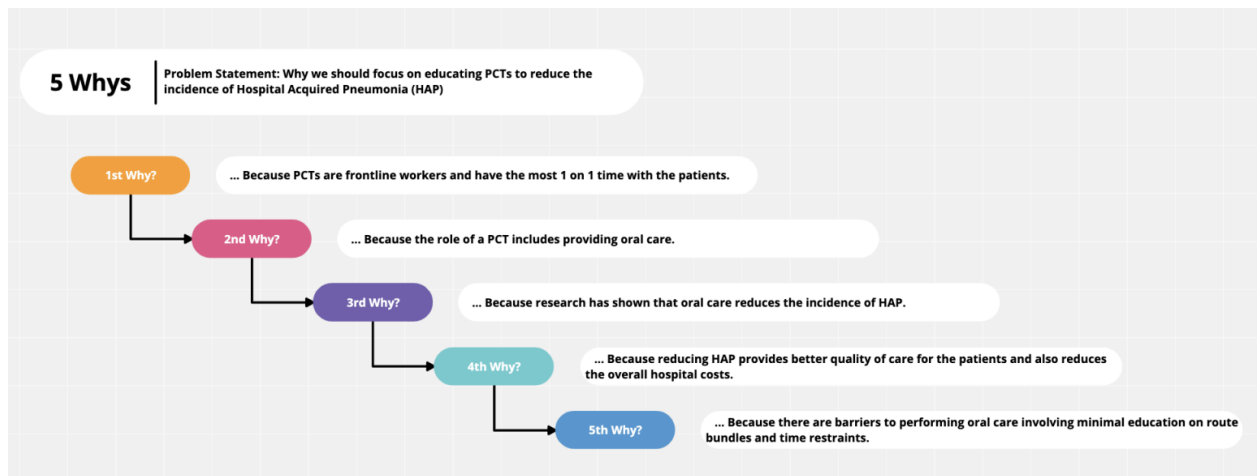


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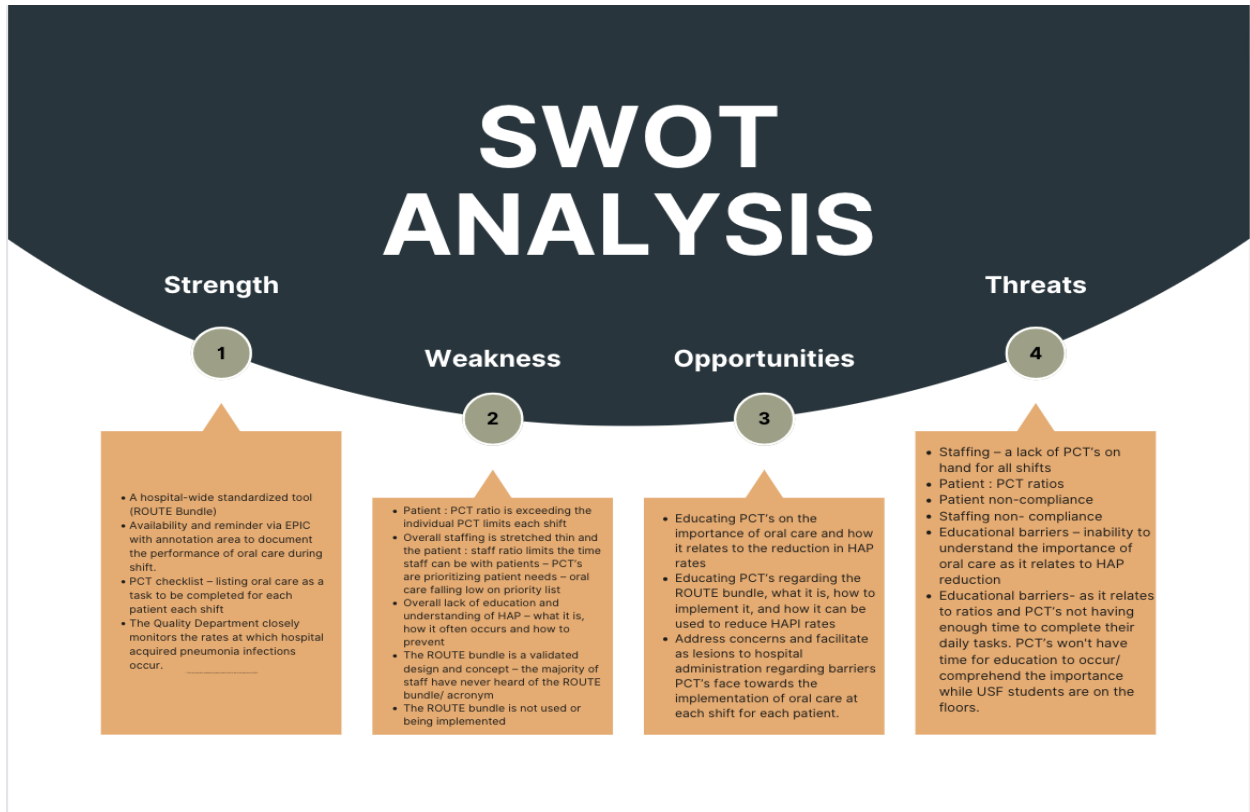
Appendix B: Fishbone Diagram



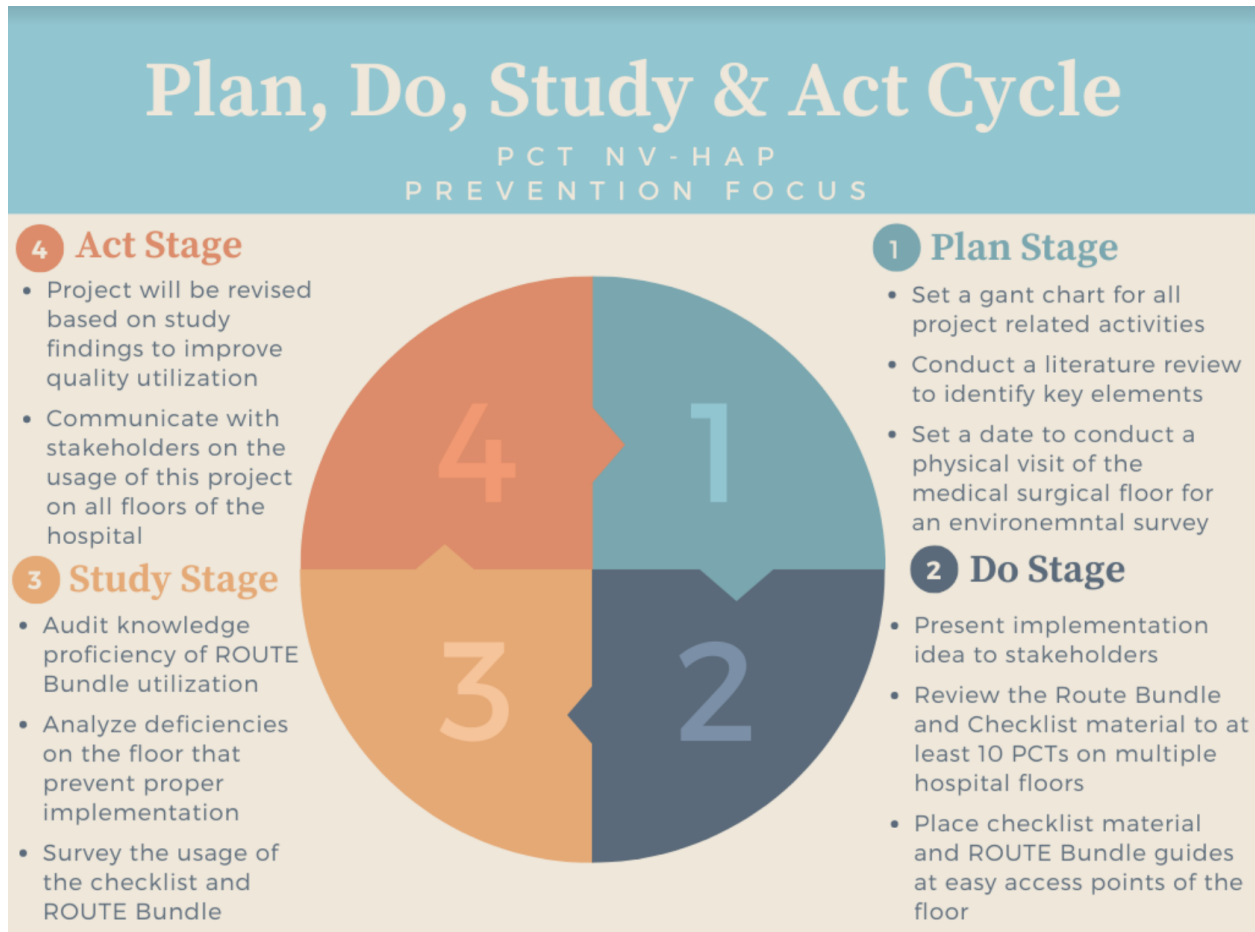
Appendix C: 5 Whys Diagram



Appendix D: SWOT Analysis



Appendix E: PDSA Cycle



Appendix F: Pre-Survey



ROUTE Refresher
Script

Hi, my name is _____ I am a clinical nursing student from University of San Francisco (USF). We are implementing a quality improvement project to reduce the rates of Hospital Acquired Pneumonia that includes a short survey and education material. We have (coffee/pastries/ Sharpies and multicolor pens) for your time. It should only take a few minutes.

Name	Unit	PCT Y/N (if no- note which unit)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

Questions:

1. During your shift, are you able to do oral care on your patient assignment?

YES NO

If yes...

2. How many times per shift?

_____ [Morning (AM) / Afternoon (PM) / Night (NOC)]

3. What are some of the barriers to get this accomplished?

4. Do you know what the ROUTE bundle is?

YES

NO

This material was already created by Kaiser so today we will just have a quick refresher on the ROUTE bundle and get your feedback.

(Give handout to follow along with)

ROUTE stands for: *(Relevance)*

Respiratory Care/Reduction and Sedation:

- Incentive spirometry (10 breaths every two hours while awake) *(PCT)*



- Not using too many sedative medications like valium or ativan *(Nurses and Physicians)*

Oral care:

- Oral care twice a day with a soft toothbrush *(PCT)*
- Chlorhexidine rinses twice a day if its ordered by the doctor *(PCT)*

Up and walking:

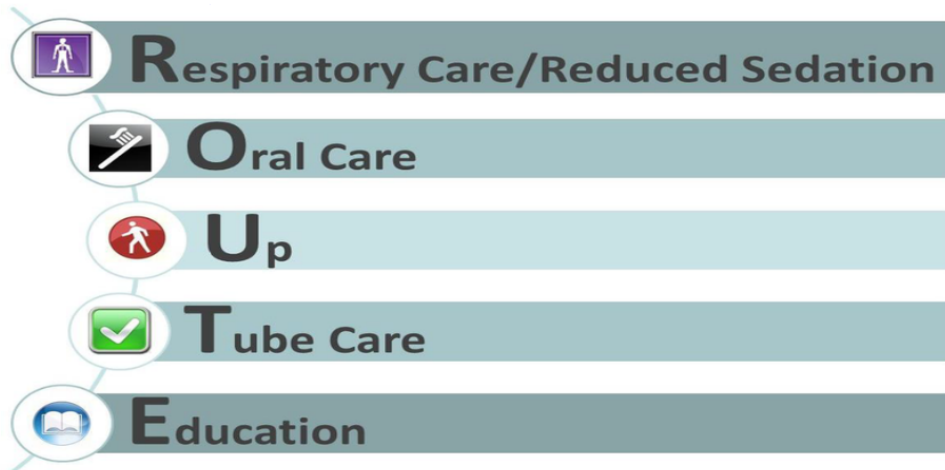
- Walking 20 feet two times a day *(PCT)*
- Sitting up in a chair when the patient is eating *(PCT)*
- Head of bed up at least 30 degrees *(PCT)*



Tube care:

- Checking if the tube is in the right position for feedings *(Nurses)*
- Seeing if the patient still needs the tube *(Nurses)*
- Check if its still working properly *(Nurses)*

Education: Remind patients to use *(PCT)*



Our main focus is on Oral care since our research shows that it is really important when trying to decrease hospital acquired pneumonia (HAP) because all the germs in the mouth multiply so quickly, and easily spread into the lungs making people sick.

We want to make sure that patients are getting their teeth brushed after every meal, which is around 3 times a day.

Questions:

5. ***We were thinking of some ways that could help motivate patients to brush their teeth more. Do you think working with nutrition to have a toothbrush on the meal tray is a good idea?***

YES
NO

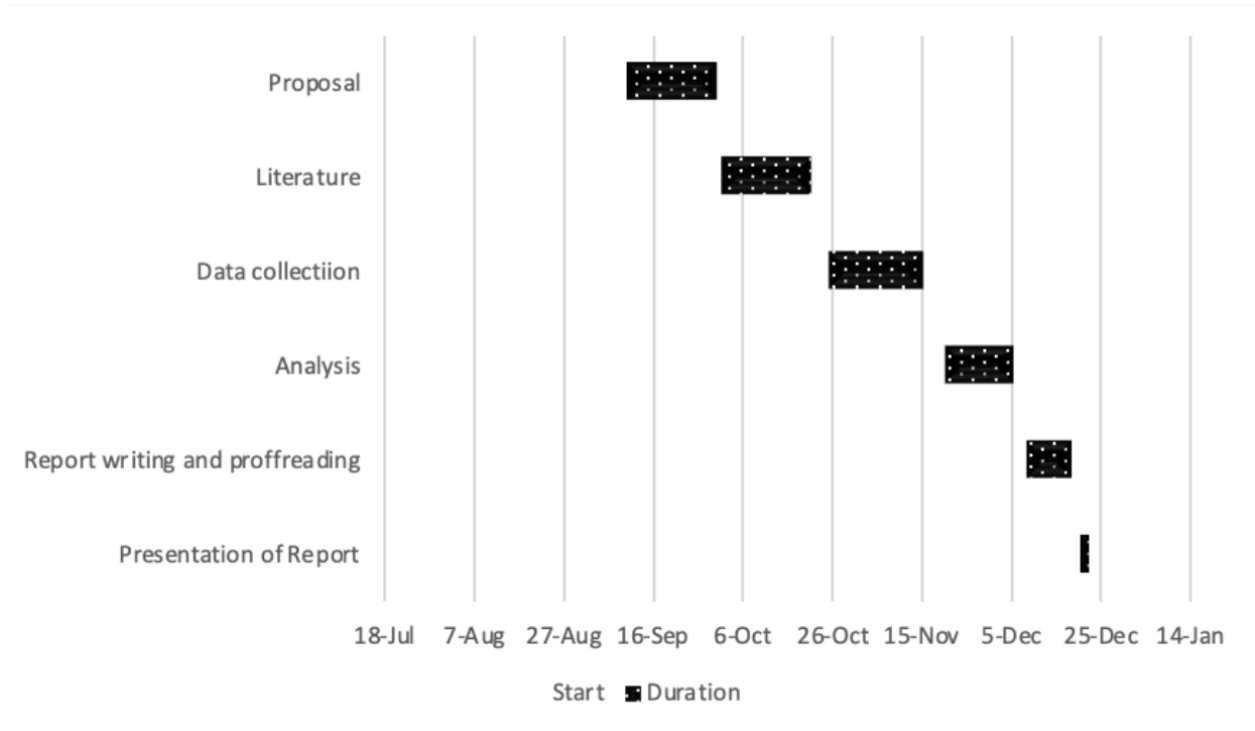
6. *Do you have any ideas on how we can increase oral care and tooth brushing rates on your floor?*

7. *Where do you document oral care?*

PCT Checklist

This checklist is an aid to help keep track of ROUTE tasks. They will be available with the Nurse manager.

Appendix G: Gantt Chart





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 intent to, or possibility of publishing your work, you and supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: <i>“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.”</i>	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):

Munroop Thiara _____

Signature of Student:

 _____ **DATE** 12/1/2022 _____

SUPERVISING FACULTY MEMBER NAME (Please print):

Theresa Mostasisa

Signature of Supervising Faculty Member

DATE _____