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Preventing Hospital Acquired Pneumonia: A Quality Improvement Project

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Preventing Hospital Acquired Pneumonia: A Quality Improvement Project

Abstract

Problem: From October 2016 to September 2017, the 5th floor medical surgical telemetry unit has had 9 incidences of hospital-acquired pneumonia (HAP). Among the facility, this is the floor with the highest HAP incidences.

Context: HAP is associated with $40,000 to $65,000 to each patient care cost; an additional 7-9 days of stay in the hospital, increases the chances of discharging a patient to a skilled nursing facility instead of home, and has an attributable mortality rate (Quinn, et al., 2014).

Interventions: Daily oral brushing self-audits are given to patient care technicians (PCT) for both day and evening shifts. For patient mobility, scorecards that have the progressive mobility levels are placed in certain rooms in one of the unit's wings.

Measures: Oral brushing and mobility care are to be done with patients daily to assist in HAP prevention. The region provides daily scores of oral brushing percentage and average progressive mobility score. The project's balancing measures are workplace safety and falls.

Results: The average percentage of oral brushing increased from 38% to 61% on 5 East while the oral brushing percentage increased from 45% to 65% on 5 West. The baseline average mobility points for the month of May 2018 was 4.1. It is now at 4.32 since last July 7, 2018.

Conclusion: There are signs of positive improvement on oral brushing percentage and average mobility scores on the unit. Noted suggestive evidence of the need to modify interventions to maximize benefits and sustainability of the results. These can include verification of oral brushing documentation, placing mobility scorecards in every room instead of a number of rooms, daily huddles of data from previous day and job aids for float and new staff.

Introduction

Hospital acquired pneumonia or HAP is considered a hospital-acquired infection (HAI). It is pneumonia that develops 48 hours post admission of a patient (Sethi, 2017). HAI is an "infection patients can get while receiving medical treatment in a healthcare facility" (Centers for Disease Control and Prevention [CDC], 2016). According to Quinn, et al. (2014), HAP is associated with $40,000 to $65,000 to each patient care cost; an additional 7-9 days of stay in the hospital, increases the chances of discharging a patient to a skilled nursing facility instead of home, and has an attributable mortality rate. Ultimately, HAP can harm patients and the organization itself. Nurses as health care professionals, have a responsibility to advocate for patients and protect them from harm. Therefore, HAP prevention is an important factor to be addressed.

Problem Identification

From October 2016 to September 2017, the 5th floor medical surgical telemetry unit has had 9 incidences of hospital-acquired pneumonia (HAP). Among the facility, this is the floor with the highest HAP incidences. There is a gap in standardization and education regarding oral brushing and mobility on the unit. Ideally, 100% of patients should have their teeth brushed daily. For the purpose of the project, the goal is to consistently have at least 70% of patients' teeth brushed daily. The baseline average oral brushing percentage on 5 East is 38% and 45% on 5 West. In the 5th floor unit, the average level of mobility amongst patients that are mobilized by the 5th floor team is reported daily. The baseline average progressive mobility score on 5 East is 4.1 points. Mobility scores are calculated of a progressive mobility scorecard where each activity done by patients is scored between 1-7 points. The activity ladder ranges from active

range of motion (AROM) with the least points of 1 and ambulation of more than 100 feet

as the highest scoring activity of 7. Each patient's two highest scoring mobility

interventions are counted. The daily goal is an average of 4.8 points. Because this

mobility scoring is fairly new to the unit, there is a possible gap in the staff's knowledge

on what the scoring system is based upon. Both oral brushing and mobility are crucial in

HAP prevention for both promote healthier lungs to prevent deconditioning of patients.

PICOT Question

The PICOT question that guided the search for evidence in this project was:

patients in the 5th floor medsurg-tele unit with the exception of comfort care patients (for

mobility) (P), how does the Implementation of highest level of mobility and adherence to

oral brushing (I) compared to no mobility or poor oral brushing (C) affect the decrease of

hospital acquired pneumonia (HAP) cases (O) by the end of August 2018 (T)?

A comprehensive electronic search was conducted in March 2018 reviewing

evidence that examined the correlation of HAP prevention with oral brushing and early

and increased mobility in the following databases: Cochrane Database of Systemic

Reviews, CINAHL Complete, and Pub Med. These databases were searched using

combinations of the following search terms: hospital acquired pneumonia, HAP, early

mobility, ambulation, oral care, and oral brushing. Limitations were set to include

English only, research, systemic reviews, randomized controlled trials, and publication

dates no earlier than 2013. The search yielded 572 articles. Articles were considered for

inclusion if they included facts about HAP, correlation between HAP prevention, and

specific interventions including mobility and oral brushing. Nine articles met inclusion

and exclusion criteria and were selected for review. They include is a systematic review,

randomized control trials, quasi-experimental, and a retrospective case control study. The evidence found is strong in supporting the project and its measures.

Available Knowledge

El Rabbany et al. (2014) conducted a systematic review of 28 randomized controlled trials that evaluated the efficacy of at least one prophylactic oral health procedure and how this reduced HAP. The study found a general trend that suggested a correlation between good oral care and lower rates of HAP. However, according to Robertson and Carter (2013), there is a lack of specific procedures and protocols regarding oral care for patients that transition from ICU to acute wards. "The notion of oral care being an optional care practice suggests nurses do not fully understand the benefits of evidence-based oral care protocols" (Robertson and Carter, 2013, p.11).

The most common diagnosis or conditions that are treated on the 5th floor medical telemetry unit are congestive heart failure, stroke, sepsis, acute respiratory failure, cancer, altered level of consciousness, heart attacks, and post-surgery cases. According to Stolbrink et al. (2014), inactivity and reduced clearance of secretions are also associated with patients who develop HAP. Stolbrink et al. (2014) also argues that simple physiotherapy including mobility and ambulation reduces the incidence of HAP especially in the elderly population due to their loss of functional status and being less mobile. The less the patient moves, the weaker their body gets. According to Arnold (2017), Immobility can cause muscle loss and weakness that can affect the diaphragm and intercostal muscles, reducing breathing effectiveness.

A potential challenge on HAP prevention in this setting is the variety of patients' diagnosis admitted on the unit. It can get confusing for caregivers. Standardization in

mobility and oral brushing protocols can play a role, but HAP prevention may have to be approached differently depending on the diagnosis or condition of each patient.

Rationale

According to Finkelman (2016), there are times when a healthcare organization may need to go through change because of government regulations, technology, patient rights, reimbursements, new evidence based research findings, and many more. Lewin's force-field model of change is one of the many change theories that can be applied to the concept of change. Lewin's theory has three stages, which are the unfreezing stage, the moving stage and the freezing stage. This theory will guide my project because the unit's transition to the change fits the interventions and transformation the unit and the staff will need to implement. The culture on the unit is established; after all, some of the staff have been doing what they're doing for more than twenty years. The theory provides a guide that can assist the team in understanding that changes guided by evidence-based practice can lead to positive outcomes. Nursing practice has room to grown and can develop to something more positively impactful for the patients. Watson's Caring Theory also plays a role in the project. By promoting oral brushing, mobilization and the prevention of HAP, we are assisting with the basic physical needs of our patients and creating a healing environment for them, while simultaneously creating a trusting and caring relationship through our advocacy.

Project Aim

The HAP prevention project focuses on the responsibility and capability of every caregiver in advocating for every patient in keeping them from harm. The project aims to

achieve an oral brushing average percentage of 70% and 5 East will have a progressive

mobility average of 4.8 points by August 2018. This aims to ultimately lead to the global

aim of increasing the number of days between HAP incidences in the 5th floor medical

telemetry unit from 64 days to 100 days between HAP incidences by August 2018.

Methods

Context

To provide the utmost care to our patients with the use of Caring Science and to

advocate for our patients to cultivate their health in partnership with a care team that

they can fully trust. That is the purpose and mission of the medical –surgical telemetry,

oncology, and stroke unit in the 5th floor Kaiser San Leandro. It is a 48-bed unit. The

age distribution of the patients that are admitted in the unit can be approximated to be

15% 19-50 years old, 30% 51-65 years old, 35% 66-75 years old and 25% 76 years old

and older. The unit is multi skilled in treating a variety of diagnosis. Majority of the

patients admitted are from the emergency department, ICU re-classes, and direct

admissions from home for cancer patients needing chemotherapy.

The goal of this project is to standardize and implement two evidence-based

interventions known to decrease the chance for patients to develop a hospital acquired

pneumonia. The interventions include daily oral care and daily mobility. The hospital

acquired pneumonia prevention team will then transition to the moving stage. This is the

second stage in Lewin's theory. The goal of the project including its measures will be

clearly communicated. Test of changes addressing the barriers identified in stage 1 will

go through the plan, do, study, act (PDSA) process. And when desired outcomes are

achieved, Lewin's third stage of refreezing can take effect to ensure that the change is permanent.

A SWOT analysis (see Appendix B) was done. The strength in this microsystem is that the staff are skilled and very knowledgeable when it comes to HAP prevention. Materials like toothbrushes, toothpaste, and mouthwash are all readily available for patient use. Mobility equipment are also available on the floor for the staff to safely mobilize our patients. Resources like the infection control department and physical therapists are all very much willing to be a resource to the staff when concerns arise. But because there is an obvious variety of diagnosis treated on the floor, standardization of oral brushing and mobility can be challenging. There is an opportunity to strengthen the collaboration between nurses, PCTs, physical therapists and respiratory therapists to create a standardized approach with oral brushing and mobility depending on patient diagnosis and their current level of function. There is a need to change the unit's culture. The change is welcomed because the past system of daily ambulation based the scoring on patients who has a prior level of being able to stand (level III), walk less than 50 feet (level IV), walk more than 50 feet (level V), and who amongst them were able to walk at least 21 feet twice a day. This change in the mobility scoring system has caused confusion for staff. In addition, patients who were immobile on admission were not receiving passive range of motion due to the focus on patients who are able to ambulate.

Education for the team is needed to reinforce the new mobility ladder. In addition, patient and family education information about the importance of oral brushing and progressive mobility is needed. Technology also needs to be leveraged in order to

provide real time information on the status of both oral brushing and progressive mobility for every patient. From time to time, the unit encounters staffing challenges, which can greatly affect the workflow of the staff. Inconsistent teamwork can create a barrier for the care team to work together for the best patient outcomes. And lastly, workflow changes can be interpreted as a threat by many of the staff, which again can create challenges in accomplishing the goals of the project.

Currently, the nine incidences of HAP on the 5th floor unit, have an average of 64 days in between incidences. The global aim is to increase that to 100 days. To calculate the financial impact and return of investment of the project, the HAP incidences pre and post the test of changes, the extended hospital stay of patients after getting HAP and how much on average is each inpatient stay at the hospital cost all needs to be considered. To provide an approximate return of investment for this project, the 100 hospital avoided HAP days can result in a saving of $334,300 considering that an average cost of expenses per inpatient day is $3,341 and each HAP case can lead to an extra 7 days of hospital stay (see Appendix C).

Interventions

For oral brushing, the expectation is to have patients have their teeth brushed either by a nurse or a patient care technician at least twice a day, once in the morning and another in the evening. The first test of change is utilization of a self-auditing tool (see Appendix D) that was given to patient care technicians (PCT) in the beginning of the days and evening shift. It included an area where they indicated if the oral brushing is done. If not done, the PCTs wrote the reason down on the tool. ANMs collected this

tool after every shift. The goal was to hold frontline staff accountable and to help the

staff remember to get the task done.

An educational session to describe the new mobility ladder was developed and

delivered to the team to increase awareness for staff regarding proper mobility

progression. This involved education from a mobilization champion from the region who

discussed the progressive mobility scoring, proper documentation, and rules. Physical

therapists also went over mobility equipment that staff can use to maximize patient's

mobility. It is intended to increase the knowledge and confidence of the front line staff,

while decreasing the fear and uncertainties in mobilizing patients. The training also

taught the frontline staff on how to properly assess patients' mobility and how they can

determine when the patient may be ready to progress.

   The test of change was a creation of a mobility scoreboard (see Appendix E) that

was placed in every patient room that helped determine the highest level of mobility of

the patient. This mobility scoreboard was to be updated every shift or every change in

patients' level of mobility. The idea is to progress the mobility of the patient up the

mobility ladder throughout the day, earning patients higher scores that can lead to the

average goal of 4.8 points. The desired outcome is an increase on the daily average

mobility report.

Study of the Intervention

   The first stage in Lewin's change theory is the unfreezing stage, which generally

revolves around the concept of "developing problem awareness and decreasing forces

that maintain the status quo" (Finkelman, 2016, p. 71). In the case of the 5th floor

telemetry unit, there were 9 total HAP incidences averaging 60 days between

incidences. This first stage is the undoing stage. It's the letting go of the current

process. The 5th floor team will assess the baseline process of HAP prevention. Barriers

and possible quality gaps in successful implementation of the current HAP prevention

process will be defined and modified through data gathered from a cause and effect

assessment.

For oral brushing, the number of patients whose teeth were brushed twice a day

will be the numerator. The denominator will be the number of total patients in the unit.

The goal is 70% of patients get their teeth brushed. Initially, PCTs were instructed to

retrieve the forms themselves upon the start of their shifts. However, PCTs didn't

consistently get the audit forms. On May 30, 2018, the assistant nurse managers on the

unit then decided to hand the paper to every PCT on every AM and PM huddle to

ensure that every PCT gets the audit form.

With mobility, a daily regional report is sent to the management team daily. The

report provides a line graph, which easily tracks the progress of both east and the west

wing. The report also provides detailed information on the accounted mobility for every

patient. The daily goal for mobility is 4.8 points. RNs and PCTs utilized a progressive

mobility scoreboard that mimics a color-coded ladder that shows mobility progression.

The first intention of the mobility scorecard was to follow mobility progression of specific

patients. Because of this, the scorecards were initially placed only on four specific

rooms. Since the data extracted daily were of the whole 5 east wing, it was hard to

determine if the mobility scorecards were impacting the mobility scores. To better

correlate the daily mobility score with the test of change, the mobility scorecards were

placed in all the rooms in 5 east.

Measures

The global aim measure of the HAP prevention project is the days between HAP cases. The data source will be the hospital acquired infection (HAI) report. The target is to increase the days between HAP incidences from 64 days to 100 days. The project aim is to increase the patients who have oral brushing twice a day to 70% and to increase the patients who are ambulated daily on 5 East to an average of 4.8 points. The balancing measures are falls and workplace safety issues.

Ethical Considerations

The HAP project and its implications involve beneficence, nonmaleficence and patient advocacy. Caregivers have a responsibility to protect patients from harm. This is the right thing to do. Patients give their trust to caregivers and most of them cannot do things for themselves due to their sickness. They come to the hospital to get better and to not get sicker. Some patients may not understand that oral brushing and mobility may feel like an extra burden for them when they should be resting and recuperating from being sick. Patients and their families need education regarding the project and why it's beneficial. However, patients' autonomy still needs to be respected. Despite a patient's refusal, there needs to be continued education about the benefits of oral brushing and mobility. There is no giving up on patients; that's what remarkable nurses do.

The project was reviewed by faculty and is determined to qualify as an Evidence-based Change in Practice Project, rather than a Research Project. Institutional review board (IRB) review is not required.

Results

There were no incidents of HAP on the unit throughout the project. The average oral brushing percentage on 5 east went up from an average of 38% to 61% while the average on 5 west went up to 65% from 45% (see Appendix F). The increase in the percentage was projected. The reinforcement of the process of making sure the task is done, staff accountability and ownership, and ensuring that the task is documented all contributed to these results.

The mobility scorecards initially started with four patient rooms in attempt to possibly coordinate the test of change with specific patients. As mentioned, the scorecard not only hopes to be a visual cue to provide readily available information regarding the patients' mobile capability but to also serve as a guide in advancing the patients' mobility shift by shift. The test of change started on June 5th. The total mobility on the wing where the test of change was happening saw a gradual increase on the average mobility points starting from June 6, but eventually trended down again. The mobility scorecard was then placed up on every room on June 18. The average mobility score increased from 4.1 points to 4.32 points (see Appendix G).

Discussion

The oral brushing self-audit tool was successful in that it raised awareness of the need to incorporate oral brushing to their routine. There were gaps in communication from staff that floats to the department who were not fully aware of the test of change. This is evident on the data. However, data does show a steady climb on the percentage of patients who are getting their teeth brushed daily. Some PCTs have also noted that they have found that circling back to the patient despite an initial refusal has been

helpful in encouraging them to understand the importance of oral brushing. At this time,

since the results appear promising, the self-audit will be adapted on the unit.

The recent change on how the mobility scores are calculated created a huge need to re-

educate the whole staff. This change led to development of the mobility scorecard as a

visual tool. The mobility scorecard as a visual aid for the staff, the patients and their

families is predicted to assist with remembering the progressive mobility ladder once

education to the staff is solidified.

Conclusions

There is speculation regarding the sustainability of self-audit, but the idea behind

the self-audit is to eventually solidify the routine of the frontline to involve oral brushing

and to allow for nurse leaders to hold staff accountable if oral brushing is not done.

Eventually, the hope is that the self-audit will not even be necessary. The proper time as

to when this can happen can be determined through the daily oral brushing scores

received by the unit leaders. Sustainability can be monitored with or without self-

auditing in place.

The data indicates an increase in the average mobility score of the whole wing

since the test of change started. The improvement in the number of patients who are

meeting their mobility targets can be attributed to increased awareness about the

benefits of progressive mobilization for patients during this project. Staff education and

the influence of the staff champions who tested the visual mobility scorecards also

motivated the team to work together to improve outcomes for their patients. The mobility

scorecard is leading the scores in the right direction; however, there are still

opportunities in the consistency of educating the staff about how it's suppose to be

used. Because of this, the mobility team agreed to continue gathering data on its use

until we feel confident that all staff are well aware of the process of its utilization. There

are also noted opportunities in the oversight of the use of the scorecard on a shift-to-

shift basis. There are also plans to involve physical therapy with its use once the nurses

and PCTs get the process down.

It is worth mentioning that training from the physical therapists were done in staff

meeting where staff were educated about proper use of mobility equipment. They also

covered tips in progressing patients' mobility. The identification of the mobility

champions are still pending. There were challenges with connecting with the respiratory

department regarding education in proper oral brushing for patients that utilize bipaps.

This is still however a planned intervention that is being kept in the near future. There

are pending classes for all PCTs in utilization of mobility lifts and other specialty

equipment as well. These upcoming interventions are set to impact the way we will care

for our patients to continue to protect them from harm including HAP.

Nurses as professionals have the responsibility to utilize evidence to guide their

practice, and therefore improve patient outcomes. The simplicity of being aware of how

to properly brush patients' teeth and having patients mobilize can save lives. These are

basic nursing interventions. Teeth brushing and mobilizing are critical steps in reducing

patient morbidity and maintaining the patient's baseline function while hospitalized.

Sickness is not a reason to forget basic care. In fact, it becomes much more important.

This report sheds light in the value of hospital-acquired pneumonia prevention. It is

important to be aware of the consequences it creates for patients and how much of that

is on the hands of caregivers including nurses and patient care technicians. This report

hopes to empower care teams to assess and be driven to change processes to protect

patients from harm and to fulfill their roles as patients' advocates.

References:

Arnold, M. (2017). Building a Foundation of Mobility: from the ICU and across the

    continuum of care. *International Journal Of Safe Patient Handling & Mobility*

    (SPHM), 7(1), 40-44.

Centers for Disease Control and Prevention. (2016). *HAI Data and Statistics.* Retrieved

    from https://www.cdc.gov/hai/surveillance/index.html

El-Rabbany, M., Zaghlol, N., Bhandari, M., & Azarpazhooh, A. (2015). Prophylactic oral

    health procedures to prevent hospital-acquired and ventilator-associated

    pneumonia: A systematic review. International Journal Of Nursing Studies, 52(1),

    452-464. doi:10.1016/j.ijnurstu.2014.07.010.

Finkelman, A., (2016). Leadership and management for nurses (3rd ed.). *Core*

    Competencies for Quality Care. USA: Pearson Education.

Quinn, B., Baker, D. L., Cohen, S., Stewart, J. L., Lima, C. A., & Parise, C. (2014). Basic

    Nursing Care to Prevent Nonventilator Hospital-Acquired Pneumonia. Journal Of

    Nursing Scholarship, 46(1), 11-19. doi:10.1111/jnu.12050

Robertson, T., & Carter, D. (2013). Oral intensity: Reducing non-ventilator-associated

    hospital-acquired pneumonia in care-dependent, neurologically impaired

    patients. Canadian Journal Of Neuroscience Nursing, 35(2), 10-17.

Sethi, S. (2017). Hospital acquired pneumonia. Merck Manual. Retrieved April 25 ,

    2017, from http://www.merckmanuals.com/professional/pulmonary

    disorders/pneumonia/hospital-acquired-pneumonia

Stolbrink, M., McGowan, L., Saman, H., Nguyen, T., Knightly, R., Sharpe, J., Reilly, H.,

    Jones, S., Turner, A. M., (2014). The Early Mobility Bundle: a simple

enhancement of therapy, which may reduce incidence of hospital-acquired

pneumonia and length of hospital stay. *Journal of Hospital Infection*, *88* (1), 34-

39.

Watson Caring Science Institute. (2010). *Core Concepts of Jean Watson's Theory of*

Human Caring/Caring Science. Retrieved from

https://www.watsoncaringscience.org/files/Cohort%206/watsons-theory-of-

human-caring-core-concepts-and-evolution-to-caritas-processes-handout.pdf

Appendix A

Evaluation Tables

PICOT Question

In patients in the medsurge tele unit (P), how do oral brushing twice a day and increased mobility (I) compared to once or no oral brushing and no mobility (C) influence the days between hospital acquired pneumonia (HAP) incidences (O) by the end of August 2018(T)?

Study	Design	Sample	Outcome/Feasibility	Evidence rating
Arnold, M. (2017). Building a Foundation of Mobility: from the ICU and across the continuum of care. *International Journal Of Safe Patient Handling & Mobility (SPHM), 7*(1), 40-44.	Systematic Review	None	Mobility continues to be important throughout the continuum of care. It should be done early, often and progressively. Useful in creating urgency and reinforcing importance of mobility.	III A
El-Rabbany, M., Zaghlol, N., Bhandari, M., & Azarpazhooh, A. (2015). Prophylactic oral health procedures to prevent hospital-acquired and ventilator associated pneumonia: A systematic review. International Journal Of Nursing Studies, 52(1), 452-464. doi:10.1016/j.ijnurstu.2014.07.010.	Randomized control trials	28 trials included, 26 short-term studies in an intensive care unit setting and 2 were long-term studies that took place in a nursing home.	Good oral health care was suggested to be associated with a reduction in the risk for hospital acquired and ventilator-associated pneumonia. Useful in understanding the importance of oral brushing and how it associates with HAP	I B
Quinn, B., Baker, D. L., Cohen, S., Stewart, J. L., Lima, C. A., & Parise, C. (2014). Basic Nursing Care to Prevent Nonventilator Hospital-Acquired	Quasi-experimental	Pilot intervention study occurred in	The overall number of cases of NV-HAP was reduced by 37%	III A

Pneumonia. Journal Of Nursing Scholarship, 46(1), 11-19. doi:10.1111/jnu.12050		urban community, not for profit, two hospital campus, and 650-bed medical center system. Convenience Sample	during the 12-month intervention period. – The avoidance of 43 NV-HAP cases resulted in an estimated eight lives saved, $1.72 million cost avoided and 500 extra hospital days averted. Significant ROI also noted Useful in highlighting the negative outcomes associated with HAP.	
Robertson, T., & Carter, D. (2013). Oral intensity: Reducing non-ventilator associated hospital-acquired pneumonia in care-dependent, neurologically impaired patients. Canadian Journal Of Neuroscience Nursing, 35(2), 10-17.	Quasi-experimental ,comparative study involving retrospective chard review and prospective data collection	The study group is comprised of 34 subjects; two subjects were excluded from the study analysis. The retrospective group comprised of 51 subjects in an acute neurosurgical unit at a tertiary care trauma hospital in Western Canada. Subjects were non-	Significant decreases in the rate of HAP in the enhanced oral care group (p=0.039), dental status. An enhanced oral care protocol was beneficial in reducing the incidence of non-ventilator-associated hospital acquired pneumonia.	II A

		intubated care dependent adults with primary diagnosis of neurological injury/insult and at high risk for pneumonia		
Stolbrink, M., McGowan, L., Saman, H., Nguyen, T., Knightly, R., Sharpe, J., Reilly, H., Jones, S., Turner, A. M., (2014). The Early Mobility Bundle: a simple enhancement of therapy, which may reduce incidence of hospital acquired pneumonia and length of hospital stay. *Journal of Hospital Infection, 88* (1), 34-39.	Restrospective case control study	Single hospital association in Birmingham. Patients on two wards received the intervention and were compared to the control patients on two similar specialty wards. Intervention: N=678 Control:N=501	The early mobility bundle shows a promising method in the reduction of HAP incidence and increase activity in medical patients. Useful in correlating the use of a mobility bundle to HAP reduction.	I B

Appendix B

SWOT ANALYSIS

Strengths

- Skilled and knowledgeable staff
- Materials readily available
- Consistent and reliable data system
- Readily available resources

Weaknesses

- New mobility scoring system
- Lack of workflow consistency
- Gap in holding staff accountable
- Different types of diagnosis treated

Opportunities

- Hardwire oral brushing and progressive mobility to workflow
- Provide education to patients/ families regarding HAP prevention
- Familiarize staff with mobility ladder/progression
- Elevate technology

Threats

- Staffing challenges
- Push back with test of changes
- Falls
- Gaps on teamwork

Appendix C

Description	Cost Avoidance Measure	100 Days Without HAP	Cost Savings
Each HAP is approximately an extra 7 day stay in the hospital. Approximate cost of 1 inpatient stay in the hospital: $3,341	Total approximate cost of added stay in the hospital for all every HAP: $23,387	3,341 x 100 days (or 14 HAPs)	$334,100

Appendix D

DATE AND SHIFT _____

PCT _____

Room Number	Oral Brushing Done? ✔ / ✘	If Not Done (State reason)	Charted? ✔ / ✘
5201			
5202			
5203			
5204			
5205			
5206			
5207			
5208			
5209			
5210			
5211			
5212			
5213			
5214			
5215			
5216			
5217			
5218			
5219			
5220			
5221			
5222			
5223			
5224			

Appendix E

Progressive Mobility Score Card

Room #

Patient:

Date

NOC	DAY	EVE
Independent	Independent	Independent
X1 assist	X1 assist	X1 assist
X2 assist	X2 assist	X2 assist
Comment:	Comment:	Comment:
7 — Walked over 100 feet	7 — Walked over 100 feet	7 — Walked over 100 feet
6 — Walked 51-100 feet	6 — Walked 51-100 feet	6 — Walked 51-100 feet
5 — Walked 21-50 feet	5 — Walked 21-50 feet	5 — Walked 21-50 feet
4 — Walked 1-20 feet	4 — Walked 1-20 feet	4 — Walked 1-20 feet
3 — Stood at bedside	3 — Stood at bedside	3 — Stood at bedside
3 — Up to commode/chair	3 — Up to commode/chair	3 — Up to commode/chair
2 — Sat at edge of bed/dangle	2 — Sat at edge of bed/dangle	2 — Sat at edge of bed/dangle
1 — Up in cardiac chair/AROM	1 — Up in cardiac chair/AROM	1 — Up in cardiac chair/AROM
0 — PROM/Resting in Bed	0 — PROM/Resting in Bed	0 — PROM/Resting in Bed

POINTS

Please don't forget to chart!

Appendix F

Oral Brushing Percentage- 5 East

Oral Brushing Percentage- 5 West

Appendix G

Average Mobility Points- 5 East

Appendix H

5th Floor Progressive Mobility PDSA Process Map

Appendix I

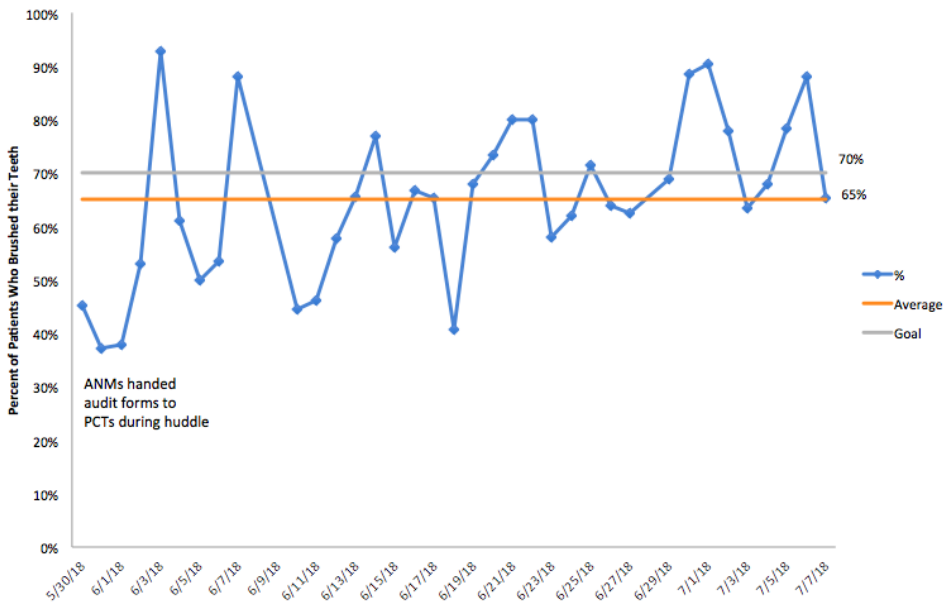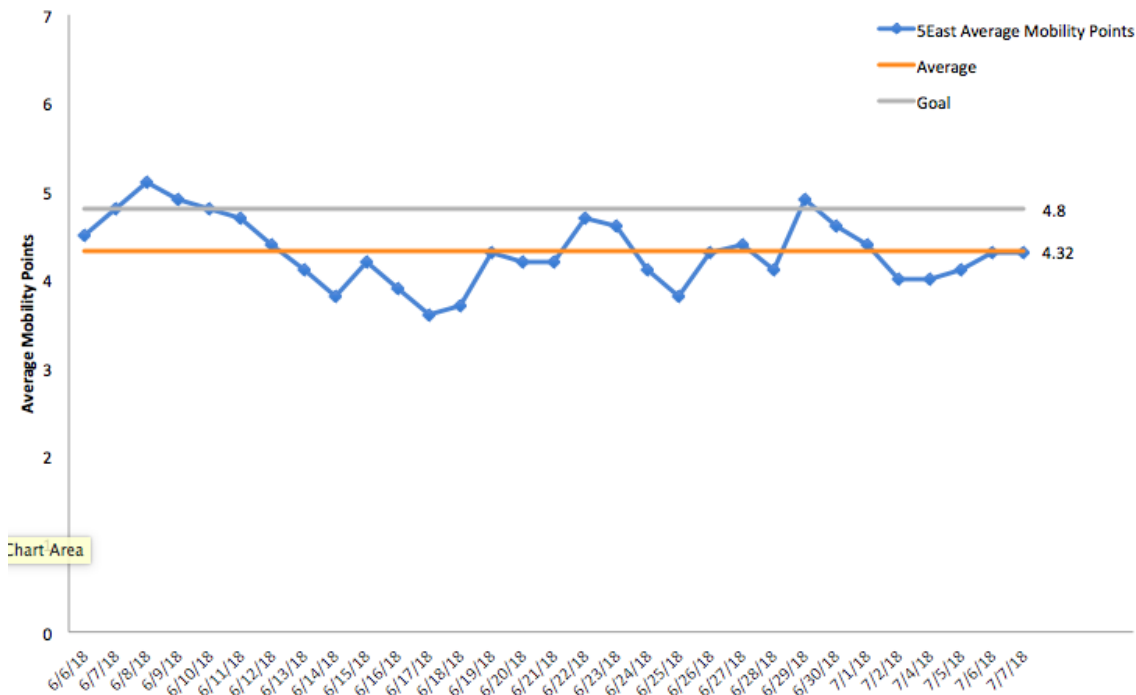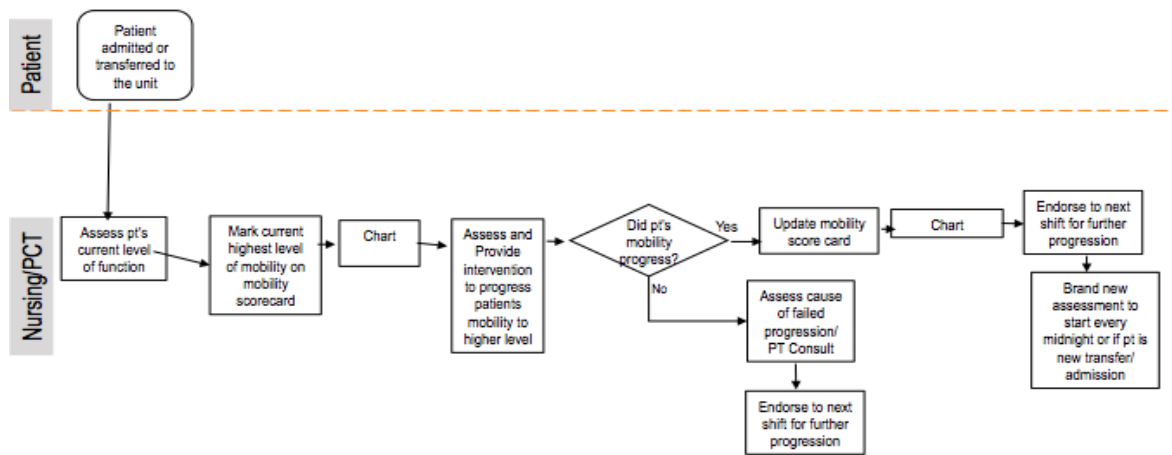| PLAN	DO	STUDY	ACT
What change will you test? Self Audits of Oral Brushing Who will perform the test? RNs and PCTs Where will the testing take place? 5th Floor East and West When will the testing take place? June 5- June 30 Data will be collected through daily oral brushing reports	Huddled at beginning of shift and provide audit sheets to PCTs right after huddle Data to be analyzed through a run chart and observations	Prediction: Staff will understand mobility progression ladder Learning: The staff who saw the mobility scorecard felt like it's useful to have a visual to help them remember the next level of mobility progression Prediction: Patients with mobility scorecard will progress in their mobility throughout their stay Learning: inconsistency with utilization of mobility scorecard due to staff not being aware of test of change	Huddle test of change to all staff, orient float staff to test of change, discuss scorecard during NKE. Post scorecards on all 5 East rooms.
What change will you test? Self Audits of Oral Brushing Who will perform the test? RNs and PCTs Where will the testing take place? 5th Floor East and West When will the testing take place? June 5- June 30 Data will be collected through daily oral brushing reports	Huddled at beginning of shift and provide audit sheets to PCTs right after huddle Data to be analyzed through a run chart	Prediction: Staff will understand accountability in providing oral brushing for patients Learning: Staff tracked their task better and remembered to chart Prediction: Self audit forms will allow for better tracking of barriers including refusal Learning: inconsistency with utilization of mobility scorecard due to float staff not being aware of test of change	Huddle test of change to all staff, orient float staff to test of change, track barriers through Pareto Chart

Appendix J

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CNL Project: Statement of Non-Research Determination Form

Student Name: _____Calyn Pascual_____

Title of Project:

Preventing Hospital Acquired Pneumonia: A Quality Improvement Project

Brief Description of Project:

A) Aim Statement:

Days between the hospital acquired pneumonia (HAP) cases will increase from a baseline of 64 days to 100 days by end of August 2018

B) Description of Intervention:

PCT/RN will perform oral brushing with every patient twice a day AM and PM. A self-audit tool will be given to every PCT on the AM and PM shift to hold staff accountable in ensuring that oral brushing is done with their patients and that is charted.

A mobility scorecard will be placed in every patient room that will help determine the highest level of mobility of the patient. This scoreboard is to be updated every shift or every change in patients' level of mobility.

C) How will this intervention change practice?

There is a lack of emphasize in HAP prevention by simply performing oral brushing. By giving the PCTs a self-audit tool, the staff is held accountable. The idea is to really incorporate oral brushing to the workflow while understanding the role it plays on our patients' outcomes.

By educating our patients and families, we can correct the misunderstanding that resting will allow for better healing. We often hear our patients refuse mobilization because they are so tired and they want to rest so that they can heal faster. The care teams often have to educate the patients of the opposite effect of just staying in bed. Standardized education of the importance of mobilization to every patient and their families will allow our patients to understand that always staying in bed can cause deconditioning, weakness and of course HAP. There is an emphasis in safely

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families will allow our patients to understand that always staying in bed can cause deconditioning, weakness and of course HAP. There is an emphasis in safely progressing patient's mobility as much as possible. Frontline are encouraged to utilize equipment and escalation to physical therapy when necessary. The mobility scorecard will serve as a visual aid to the staff and the patients themselves of their level of mobility and their progression.

D) Outcome measurements:
-Days between HAP incidences.

Process Measure:
-Oral brushing
-Mobility

Balancing Measures:
-Falls
-Workplace Safety

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)

☐ 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	x	

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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.		
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: *"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):
_____Calyn Pascual_____
Signature of Student:
_____DATE: 4/29/18

SUPERVISING FACULTY MEMBER NAME (Please print):
_____
Signature of Supervising Faculty Member
_____DATE_____

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Appendix K

Hospital Acquired Pneumonia Prevention on the 5th Floor Kaiser San Leandro

Charter

Calyn S. Pascual

University of San Francisco

Table of Contents

Project Charter

AIM

Project: Implementation of progressive mobility and adherence to oral brushing in the MS/Tele unit will increase the days between the hospital acquired pneumonia (HAP) cases from 64 days to 100 days by end of August 2018.

Background: Hospital acquired infection (HAI) is an "infection patients can get while receiving medical treatment in a healthcare facility" (Centers for Disease Control and Prevention [CDC], 2016). According to Quinn, et al. (2014), HAP is associated with $40,000 to $65,000 to each patient care cost; an additional 7-9 days of stay in the hospital, increases the chances of discharging a patient to a skilled nursing facility instead of home, and has an attributable mortality rate of 50%. From October 2016 to September 2017, the 5th floor had 9 incidents of hospital-acquired pneumonia (HAP). The 5th floor unit is an oncology, stroke, and cardiac telemetry unit. It has a population of patients with different diagnosis and complications. This makes the process of applying the route bundle to every patient challenging for the approach can differ depending on the patient's diagnosis. Bundles have been developed for the prevention of ventilated associated pneumonia (VAP), but according to Robertson and Carter (2013), there is a lack of specific procedures and protocols regarding oral care for patients that transition from ICU to acute wards. "The notion of oral care being an optional care practice suggests nurses do not fully understand the benefits of evidence-based oral care protocols" (Robertson and Carter, 2013). The 5th floor utilizes the ROUTE bundle for HAP prevention. It stands for respiratory, oral brushing, up and about, tube feeding and education. Respiratory pertains to the utilization of incentive

spirometer. Oral brushing is expected at least twice a day. Patients are encouraged to sit up for meals and to maximize mobility. Patients with tube feeds are always treated for the risk of aspiration, therefore, head of the bed needs to be up and locked, and tube dressing needs to be marked and is intact. This is the tube feed care bundle. It is also expected for HAP prevention education to be provided to the patients and their families. There have been a surge of new employees on the floor and there have been changes that have been made to the original process of applying the ROUTE bundle to every patient.

Goal: The goal of the project is to prevent patient harm and to empower staff in making a positive impact to patient outcomes. It is important to recognize that caregivers can impact the outcome of patients. As simple as oral brushing or progression of mobility can make a difference on the healing process of an individual. The project aims to increase the days between HAP incidences from every 64 days to 100 days by the end of August 2018. The project will focus on reinforcement of the ROUTE bundle's components of oral brushing and mobility.

Measures:

Outcome Measure	Data Source	Target
Increase days between HAP cases	HAI Report	From 64 days to 100 days
Process Measures		
Number of patients who brushed their teeth twice a day	Chart audit/Infection prevention report	70%
Daily average mobility score	Progressive Mobility Reports	4.8 points

Balancing Measures		
Work place safety	Observational, WPS Report	≤10
Falls	Observational	≤5

Measurement Strategy:

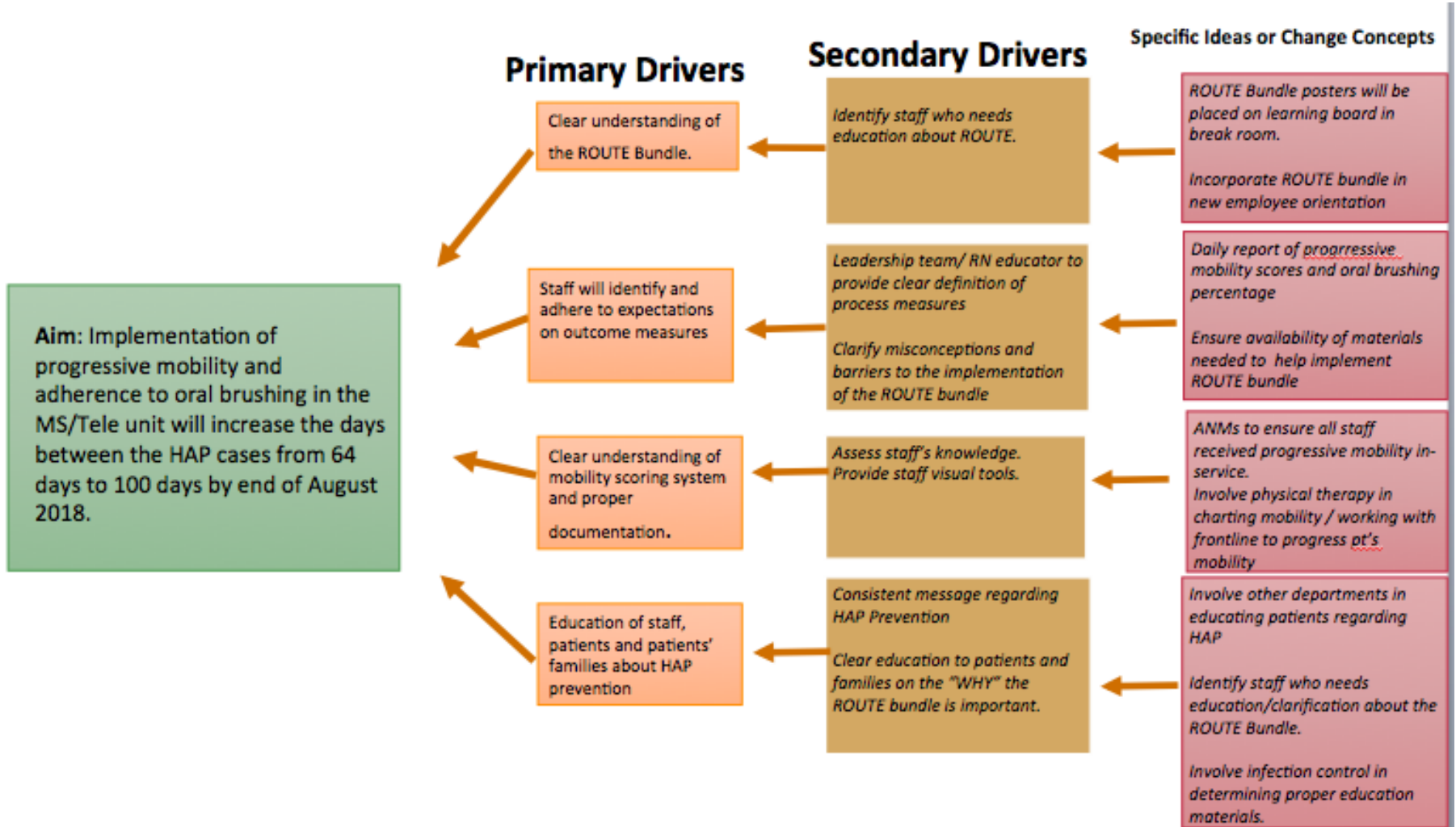| Measure	Measure Definition	Data Collection Source	Goal
PCT/RN will provide oral brushing to all patients in morning and night daily.	N: number of patients whose teeth were brushed AM and PM. D: Total number of patients excluding comfort care.	Chart audit, daily HAP reports	70%
All patients will mobilize to the highest of their capability. Patients inpatient less than 16 hours: 1 expected activity Patients inpatient more than 16 hours: 2 expected activity Out of scope: Comfort care and patients diagnosed as "brain dead."	Total average mobility score of all patients' mobility	Progressive Mobility Report	4.8 points

The image above describes the mobility ladder for patients. The more the patient does, the higher points are garnered. Every patient's mobility should involve interventions that will promote the progression of the patient's mobility status.

Team Composition/Sponsors:

- •Sponsors/ Champions: **Amy Bearden, CNE, Dana Littlepage, Adult Services Director**
- •Project Co-Leads: **Megan Mira, Saba Bayanzai, Fran Regan, Norie Bustamante, Rosalie Amacan, Jay Chua**
- •Front-Line: **PCT UBT, Michelle Pembleton, RN, Evelyn Gan (PCT), Kim Alino, RN, Mohini Chand (PCT), Jessica Low(RN), Edna Ibe (RN), Angelo Esguerra (PCT)**

Primary Drivers

Secondary Drivers

Specific Ideas or Change Concepts

Aim: Implementation of progressive mobility and adherence to oral brushing in the MS/Tele unit will increase the days between the HAP cases from 64 days to 100 days by end of August 2018.

Clear understanding of the ROUTE Bundle.

Staff will identify and adhere to expectations on outcome measures

Clear understanding of mobility scoring system and proper documentation.

Education of staff, patients and patients' families about HAP prevention

Identify staff who needs education about ROUTE.

Leadership team/ RN educator to provide clear definition of process measures

Clarify misconceptions and barriers to the implementation of the ROUTE bundle

Assess staff's knowledge. Provide staff visual tools.

Consistent message regarding HAP Prevention

Clear education to patients and families on the "WHY" the ROUTE bundle is important.

ROUTE Bundle posters will be placed on learning board in break room.

Incorporate ROUTE bundle in new employee orientation

Daily report of progressive mobility scores and oral brushing percentage

Ensure availability of materials needed to help implement ROUTE bundle

ANMs to ensure all staff received progressive mobility in-service.
Involve physical therapy in charting mobility / working with frontline to progress pt's mobility

Involve other departments in educating patients regarding HAP

Identify staff who needs education/clarification about the ROUTE Bundle.

Involve infection control in determining proper education materials.

Change to Test

The nurse leaders, educator or CNL will reinforce the ROUTE bundle. Staff will also be re-educated about its importance and how it can affect patient outcomes. Day and evening PCTs will self-audit if oral brushing is done or not done for their patients. Barriers and refusals will be documented.

Mobility scoreboards will be placed on every patient room that will help determine the highest level of mobility of the patient. This mobility scoreboard is to be updated every shift or every change in patients' level of mobility. The idea is to progress the mobility of the patient up the mobility ladder throughout the day, earning patients higher scores that can lead to the average goal of 4.8 points. The desired outcome is an increase on the daily average mobility report.

Project Timeline

Date	6/12	6/19	7/8	7/10	7/15	7/25	7/28	7/31	8/3
Define Topic	■								
Aim Statement and Background		■							
Measures Develop Charter			■						
Measurement Strategy			■	■					
Collect Data Identify Changes to Test					■	■			
Complete Charter							■		
Driver Diagram							■		
Finalize Charter Prepare Presentation								■	
Final Presentation									■

<u>CNL Competencies</u>

The clinical nurse leader acts an advocate to the patients by focusing on an aim that prevents patient harm. The CNL is able to recognize that a change in nursing practice can make a difference with patient outcomes and help prevent pneumonia. This ties in with the role of a CNL as an educator to the patients and the staff. The CNL facilitates the HAP prevention education given to the staff. A knowledgeable staff creates awareness that can be passed on to patients-- that the ROUTE bundle including ambulation and oral brushing are vital to the prevention of hospital-acquired pneumonia. The CNL acts as an information manager for the staff as well. Innovation with clinical expertise is a powerful combination. The CNL and his or her team can utilize creative tools, gather data and tell a story. This leads to the role of a CNL as an outcomes manager. Data can be utilized as a compass; a CNL can judge if a test of change is working or not and what steps might be the next to take to reach the project's aim.

<u>Lessons Learned</u>

The ROUTE bundle consists of multiple interventions and actions that contributes to the prevention of HAP. Because of this, the HAP prevention project will initially focus on two process measures, which are oral brushing and mobility. It will be beneficial to involve other disciplines like physical therapy and respiratory therapy. The guidance of infection control regarding data collection, current baseline data will need to be discussed. The whole nursing staff will need to have the understanding of the project in order to maintain adherence to test of changes that can lead to accurate data. The support of leadership will be crucial in the success of the project; resources will be utilized and depending on what story the data tells, process changes and policies might need to be reassessed.

References:

Burton, L. A., Price, R., Barr, K. E., Mcauley, S. M., Allen, J. B., Clinton, A. M., &

    Witham, M. D. (2016). Hospital-acquired pneumonia incidence and diagnosis in

    older patients. Age & Ageing, 45(1), 171-174. doi:10.1093/ageing/afv168

Centers for Disease Control and Prevention. (2016). *HAI Data and Statistics.* Retrieved

    from https://www.cdc.gov/hai/surveillance/index.html.

El-Rabbany, M., Zaghlol, N., Bhandari, M., & Azarpazhooh, A. (2015). Prophylactic oral

    health procedures to prevent hospital-acquired and ventilator-associated

    pneumonia: A systematic review. International Journal Of Nursing Studies, 52(1),

    452-464. doi:10.1016/j.ijnurstu.2014.07.010

Harris, J.L., Roussel, L., & Thomas, P.L. (2014). *Initiating and sustaining the clinical*

    nurse leader: A practical guide (2nd ed.). Burlington, MA: Jones & Bartlett

    Learning

Quinn, B., Baker, D. L., Cohen, S., Stewart, J. L., Lima, C. A., & Parise, C. (2014). Basic

    Nursing Care to Prevent Nonventilator Hospital-Acquired Pneumonia. Journal Of

    Nursing Scholarship, 46(1), 11-19. doi:10.1111/jnu.12050

Robertson, T., & Carter, D. (2013). Oral intensity: Reducing non-ventilator-associated

    hospital-acquired pneumonia in care-dependent, neurologically impaired

    patients. Canadian Journal Of Neuroscience Nursing, 35(2), 10-17.