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Oral Care Bundle Impact on Staff Assisted Oral Care

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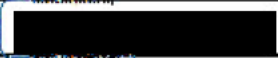Doctor of Nursing Practice Program and is Approved by:

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March 25, 2022

University of St. Augustine for Health Sciences
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Abstract

Practice Problem: Non-ventilator hospital acquired pneumonia (NV-HAP) is more common than ventilator acquired pneumonia. Oral care is the only modifiable risk factor for all patient populations.

PICOT: The PICOT question that guided this project was: In non-ventilated patients in a tertiary care setting (P), how does implementing an oral care bundle (I) compared to the current practice of individual tasks without a bundle (C) affect adherence to facility oral care standard of patients receiving oral care at least once a day (O) over six weeks (T)?

Evidence: Lack of an oral bundle that has been proven to decrease the delivery of oral care.

Intervention: Implementation of an oral care bundle including a decision-making protocol, oral care products, staff and patient education, and proper care documentation competencies. Additionally, surveillance and auditing practices were established.

Outcome: There were considerable improvements in the delivery of oral care (42.07% increase for ≥ 1 oral care activity per patient day), patient education (18.29% increase during episode of care), and documentation (47.60% decrease in oral care documentation deficiency and 50.73% decrease in oral care education deficiency).

Conclusion: Inconsistent delivery of oral care can lead to significant health concerns and costs to patients and healthcare facilities. Consistently utilizing oral care practices, such as an oral care bundle, improved the delivery and documentation of oral care and patient education.

Oral Care Bundle Impact on Staff Assisted Oral Care

Hospital acquired pneumonia (HAP), which includes non-ventilator hospital-acquired pneumonia (NV-HAP) and ventilator-acquired pneumonia (VAP), is the leading cause of nosocomial infections and contributes to high morbidity and mortality rates worldwide (Di Pasquale et al., 2016). Oral microflora has been linked as one of the primary causes of hospital-acquired pneumonia. Oral care and education are key modifiable risk factors for hospital-acquired pneumonia (Quinn et al., 2020). Sixty percent of HAP is NV-HAP (Munro & Baker, 2018). Providing oral care 2 to 4 times a day may reduce the risk of NV-HAP by 40-60% (Baker & Quinn, 2018). This scholarly project will provide evidence to support the utilization of an oral care bundle and compare pre-implementation to post-implementation states.

Significance of the Practice Problem

NV-HAP is more common than VAP. It may lead to severe complications, such as respiratory failure, pleural effusions, septic shock, and renal failure (Kalil et al., 2016). Healthcare Cost and Utilization Project National Inpatient Sample has shown that 32.6 to 35.4 million U.S. patients are at risk for NV-HAP, compared to only 3.6 to 3.9 million at risk for VAP (Baker & Quinn, 2018). The cost and mortality of NV-HAP surpass the overall cost of VAP. Likewise, NV-HAP has substantial clinical and economic burdens, prolonged hospital length of stay (LOS), and higher mortality (Giuliano et al., 2018).

Furthermore, patients with NV-HAP are up to 8.4 times more likely to require advancing levels of care, including mechanical ventilation, or demise. This escalation of care results in a longer average hospital LOS than patients who do not develop NV-HAP (Baker & Quinn, 2018). Although the absolute risk of demise associated to complications from VAP are higher than that from NV-HAP, because NV-HAP impacts more patients, more patients succumb from complications associated to NV-HAP than VAP (Giuliano et al., 2018). Patients who develop NV-HAP are 4.13-fold more likely to be discharged to a skilled nursing facility. This decrease in

quality-of-life impacts patients, their families, and society; emotionally and financially (Baker & Quinn, 2018).

Between 2009 and 2011 the total cost of VAP was $86 million; during the same time frame, NV-HAP cases cost $156 million (Giuliano et al., 2018). A two-year implementation of an oral care protocol, from 2012 to 2014, resulted in a 70% decrease hospital-wide in NV-HAP, a decline of 164 NV-HAP cases, 31 fewer patient fatalities, eight lives saved, $5.9 million in savings, and avoided 500 extra hospital days (Baker & Quinn, 2018).

The overwhelming impact of HAP, specifically NV-HAP, was brought to organizational leaders' attention where further analysis revealed difficulty understanding the specific organizational impact due to lack of data collection. The hospital mandated the collection and monitoring of NV-HAP cases and oral care. This initial data collection occurred in 2019 on a single nursing unit where two cases of NV-VAP were identified, but additional review disqualified one case from classification of NV-VAP due to patient refusal to participate in oral care (B. Lawhead, personal communication, August 4, 2021). However, the organization, citing industry data and enterprise wide emphasis on oral care as a strategic initiative for improvement, sought a standardized solution for addressing oral care needs in the adult inpatient population.

Oral care is the most researched preventive measure in HAP and is the only modifiable risk factor for all patient populations. Unfortunately, it is one of the most frequently missed type of care. Missed care in the United States and internationally is linked to poor patient outcomes and increased hospital costs (Baker & Quinn, 2018). If 100 cases of non-ventilator-associated hospital-acquired pneumonia were prevented, there would be an estimated cost savings of $400 million and a decrease of 700 to 900 hospital days (Lounsbury & Munro, 2020). Consistent and continuous oral care will result in greater patient satisfaction, improved patient care, safety, quality of life, reduced cases of pneumonia, and a decrease in healthcare costs (Lounsbury & Munro, 2020; Munro & Baker, 2018).

Nurses' and the nursing assistants' role in oral care and prevention of NV-HAP is pivotal. However, a gap between knowledge and adherence remains (Alja'afreh et al., 2019; Quinn et al., 2020; Warren et al., 2019). Compounding the concern, nursing assistants have little or no formal education on oral care practices. The organizational gap analysis revealed a need for staff awareness of oral care standards according to the protocol, including oral care tools, proper usage, and accurate documentation in the computerized charting system to track patient data and patient education. The evidence indicates combining these components bridges the gap between the current practices and established benchmark goals.

Building on the initial review in 2019, a repeated needs assessment on the identified pilot unit highlighted variations throughout the unit related to oral care, according to aggregate data reported from the electronic health record (EHR). The documentation audit report when reviewed revealed charting oral care occurring during registration and admission activities. Inconsistencies in charting content such as oral care given, oral care education, and validation of oral care product availability were present. This lack of charting could result from not providing care or staff not knowing where to chart specified care correctly. Furthermore, there is no formal training on the unit for current or new employees related to oral care protocol, patient education, or charting oral care. The practice change will address all the above issues and provide consistency of oral care expectations on the unit.

PICOT Question

The PICOT question that guides this project is: In non-ventilated patients in a tertiary care setting (P), how does implementing an oral care bundle (I) compared to the current practice of individual tasks without a bundle (C) affect adherence to facility oral care standard of patients receiving oral care at least once a day (O) over six weeks (T)?

Population

The pilot project population consists of non-ventilated medical surgical and oncology patients in a single 30-bed unit within a tertiary academic medical center.

Intervention

The intervention is the development and implementation of an oral care bundle that includes clear processes regarding oral care frequency, tools, documentation requirements, procedures for oral care, and patient education. The organization set the operational goal of achieving oral care delivery during the pilot project to at least once per patient care day.

Comparison

Current state is used for comparison to the intervention. The current state of oral care at the facility is marked by high degrees of variation between units regarding oral care supplies, oral care procedures, documentation requirements, and patient education strategies. This is further affected as oral care skills competencies are not measured. Baseline data collection occurred prior to project implementation to validate change.

Outcome

Pre- and post-data comparison of oral care competency and adherence are measured to determine if rate patient receipt of oral care measures occurs at least once per 24 hours.

Time

The project timing is six weeks. This includes staff competency training and surveillance of adherence to the oral care bundle.

Evidence-Based Practice Framework & Change Theory

Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) framework was utilized to implement this practice change. This framework assisted the adoption of evidence to facilitate a universal language, standardize processes, and incorporate the transition from the current to future state within the organization's culture (Dang & Dearholt, 2018). The model is comprised of three interconnected components: practice question, evidence, and translation. The lack of oral care policy for non-ventilated patients contributes to up to 70% of missed oral care (Munro & Baker, 2018). The evidence supports staff competency through education combined with an

oral care bundle procedure increases the delivery of oral care. Translation of the practice recommendation is implemented during the project.

Kotter's 8-Steps for Leading Change model facilitated the strategy and timeline of the practice change (2012). The model describes eight processes for change: (a) creating a sense of urgency, (b) creating a guiding coalition, (c) developing a vision and strategy, (d) communicating the change vision, (e) empowering broad-based action, (f) generating short-term wins, (g) consolidating gains and producing more change, and (h) anchoring new approaches to the culture. The change model is a simple-to-follow step-by-step process that focuses on preparing and accepting change and changing the culture of the organization (Kotter, 2012). During each of these phases the change navigates a series of milestones to move to the next phase, initializing urgency by embracing the need for change at the organizational level, to developing objectives, standing up a steering committee and pilot unit team members, to collecting, analyzing, and sharing outcomes data. These efforts in conjunction support the anticipated sustainability of the practice change.

As the JHNEBP provides the framework for clinical inquiring resulting in a clear practice change supported by empiric evidence, Kotter's 8-step model for leading change assists the project leader through the phases of change from the perspective of improving current state to the envisioned future state, even when there are those who may resist the need for change. The eight steps build across the domains of efficiency, growth, innovation, and culture (2012). For this pilot project the stakeholders and staff support the practice change; nevertheless, change can stress or strain healthcare providers. Kotter's model provides the project manager with the tools to operationalize the evidence into an action plan.

Evidence Search Strategy

To identify and evaluate clinically significant and relevant evidence for the change project the Cumulative Index to Nursing and Allied Health Literature (CINAHL) Complete, MEDLINE, and Ovid databases were utilized to conduct a rigorous review of the literature.

Inclusion criteria were based on the PICO elements and used to develop the keywords for the search. A Boolean search with the operators AND and OR was used with the key terms (oral care OR mouth care OR oral hygiene) AND (nursing care OR nursing intervention) AND (hospital policy OR protocol OR procedure). The same search criteria were used for all three databases. To narrow the search, the following limiters/filters were used: English language, available abstract, publication within last five years, and peer-reviewed academic journals. Additional strategies for the MEDLINE database include MeSH terms nursing care, nursing standards, oral health, oral hygiene, healthcare-associated pneumonia, and ventilator-associated pneumonia.

Evidence Search Results

The search produced a total of 54 articles; CINAHL yielded 17 articles, MEDLINE 18 articles, and Ovid 19 articles. Twenty duplicate articles were eliminated, leaving 34 abstracts to be screened. A further 20 articles did not meet the inclusion criteria and were discarded. The remaining articles were assessed for exclusion criteria which included patients in long-term care, home health care, and vegetative states, issues with trachea cuff, swallowing and dysphagia, intellectual disabilities, and oral health screening. Fourteen full-text articles were assessed for eligibility. Upon review five additional articles were excluded due to the nature of the article (retrospective chart review, non-research, and inappropriate article aim). (See Figure 1).

The JHNEBP evidence ratings were used to determine the nine articles' design level and quality grade post article selection. Level 1 studies are experimental, randomized control trials (RCT) and systematic reviews of RCT. While level 2 studies include quasi-experimental studies, a systematic review of a combination of RCTs, and quasi-experimental or quasi-experimental studies. Level three studies are non-experimental studies, a systematic review of a combination of RCTs, quasi-experimental and non-experimental studies, or non-experimental studies only. Level four articles include clinical practice guidelines and consensus panels. Finally, level 5

includes articles related to experiential and non-research evidence such as literature or scoping

reviews, case reports, or expert opinion statements. Each level of evidence can be included with

or without a meta-analysis (Dang & Dearholt, 2018). Assessment of the level of evidence

assigned includes three level one articles, one each level two, three, and four articles, and three

level five articles.

The quality of the articles were assessed using JHNEBP quality ratings (Dang &

Dearholt, 2018). To be considered high quality, i.e., grade A, the research material needs to be

revised or developed within the last five years and supported by a professional, public, private,

or government agency. The findings from the study should be reliable and sufficient with a

definitive conclusion. Specifically grade A quality for quantitative studies refers to evidence with

"consistent results with sufficient sample size, adequate control, and definitive conclusions;

consistent recommendations based on an extensive literature review that includes thoughtful

reference to scientific evidence" (p. 278). Grade C is characterized by inconsistent results and

study size, making it challenging to conclude findings from the data. Assessment of the quality

of the literature assigned eight of the nine articles as grade A, with one quality grade C article.

(See Appendix A).

Themes with Practice Recommendations

A thorough evaluation of the literature revealed several common themes related to an

effective, evidence-based oral care program. The identified themes include: (a) population, (b)

staff education and training, (c) multidisciplinary team utilization, and (d) oral care protocol

implementation.

Population

The synthesis of the literature supported oral care interventions in the identified

population. All nine studies were performed in tertiary care facilities. Participants included adults

18 years of age and older, in an acute care setting that included medical-surgical and intensive

care units, and individuals with or without mechanical ventilatory support. (Alja'afreh et al.,

2019; Baker et al., 2019; Chipps et al., 2016; McNally et al., 2019; Munro & Baker, 2018; Munro et al., 2018; Pai et al., 2019; Pritts, 2020; Warren et al., 2019).

Education and Training

Education was a vital component in all nine studies. All nine studies provided education and training to staff. Face-to-face training was the preferred primary method of training in all the studies. However, the frequency of training, follow-up sessions, and secondary methods of education varied. Training sessions occurred in multiple sessions, select intervals, and consistently. Videos, handouts, posters, brochures were used to reinforce the training. Additionally, several studies either endorsed or included patients and family members in receiving education on the importance of oral care and the use of oral care supplies. (Alja'afreh et al., 2019; Baker et al., 2019; Chipps et al., 2016; McNally et al., 2019; Munro et al., 2018; Munro & Baker, 2018; Pai et al., 2019; Pritts, 2020; Warren et al., 2019).

Multidisciplinary Team

The utilization of an interdisciplinary team was endorsed as an essential component to success of creating an evidence-based oral care protocol. Team member inclusion varied, but roles identified as key stakeholders include dentists, dental hygienists, speech-language pathologists, clinical nurse specialists, nurse educators, and direct patient care providers. (Baker et al., 2019; Chipps et al., 2016; McNally et al., 2019; Munro & Baker, 2018; Pai et al., 2019; Pritts, 2020; Warren et al., 2019).

Oral Care Protocol

Each study assessed utilized an oral care protocol, although there were variations on how often oral care should be implemented and what products should be used. Each study required at minimum oral care to be performed twice a day with specified products based on patient needs. The standard equipment utilized through the studies included a toothbrush, toothpaste, oral rinse, Yankauer suction, denture cleanser, a cup, and oral lip moisturizer

(Alja'afreh et al., 2019; Baker et al., 2019; Chipps et al., 2016; McNally et al., 2019; Munro &

Baker, 2019; Pai et al., 2019; Pritts, 2020).

Recommendations

A thorough review of the literature supports the development and implementation of an

oral care bundle to reduce the incidence of NV-HAP. The bundle's success is reliant on the

effect of a decision-making protocol, selection and availability of oral care products, staff and

patient education, and proper care documentation on staff-assisted oral care at least once per

day. This is accomplished through an approach utilizing a nurse led multidisciplinary team to

ensure support of experts from various specialties, working together to increase the likelihood of

success.

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Project Setting

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The setting for the DNP evidence-based scholarly project is an oncology medical-

surgical unit in a 255-bed tertiary academic veteran's hospital located in north Florida. The

mission and vision of the organization to provide exceptional service to improve health and

wellbeing of patients while supporting an integrated health system with multiple service lines is

aligned with the evidence-based scholarly project. The health system is accredited by the Joint

Commission and the Commission on Accreditation of Rehabilitation Facilities. The

organization's culture supports evidence-based change.

Organizational Need

The adult patient admitted to the oncology medical-surgical unit has a complex plan of

care. To ensure high quality care is maintained a needs assessment was completed by unit

leadership midyear 2021. Three compelling needs were identified, of which two are addressed

in this project - oral care and aspiration risk.

During the needs assessment, biweekly surveillance rounding was completed by unit

leadership. Aggregate data from the biweekly surveillance rounding showed 62.5% adherence

with completion of patient oral care and 62.5% of patient oral care supplies present in the

patient room. Documentation of observed oral care was significantly lacking with 6%

documentation rate of oral care performed at least twice a day. Determination by the unit

leadership based on bi-weekly surveillance data that procedural knowledge was present but

adherence to the standard operating procedure including supply availability, frequency of care

provision, and documentation of oral care remained an ongoing concern.

Level of Systems Change

The pilot practice change was a micro system level change as the intervention occurred

on one oncological medical-surgical unit at the organization (Melnyk & Fineout-Overholt, 2018).

The use of a pilot change allows for rapid collection and interpretation of data related to the

practice change, improving the delivery of patient care and outcomes as the lessons learned

during this pilot will be applied to the larger organizational rollout (Harris et al., 2020).

Organizational Support

The implementation of an oral care bundle is supported by organizational leadership. At

the unit level the nursing leaders have dedicated time and resources to support this pilot change

project with the intent of organization wide expansion.

SWOT Analysis

External opportunities or threats and internal strengths and weaknesses are unveiled

during a SWOT (strengths, weaknesses, opportunities, and threats) assessment of the

organization (Harris et al., 2020). Crucial to the implementation of the project, the strengths of

the organization include a highly skilled clinical staff, overwhelming leadership support,

equipment/supply availability, and education material current with best practices. Weaknesses

the project encountered consistent to the SWOT analysis included scheduling staff for training,

lack of adherence to practice change, lack of organizational policies, procedures, and

guidelines, and desire to participate in training for oral care. The project opened opportunities to

work in multidisciplinary teams to accommodate staffing scheduling and budgeting. Innovative

methods for training including remote opportunities completed online were provided and

informal patient surveys were completed to obtain the patients' perspectives. Staff turnover, infectious disease outbreaks, leadership change, and low census presented as threats during the implementation period. A diagram of the SWOT Analysis can be found in Appendix B.

Stakeholders

Stakeholder assessment for this project identified multiple stakeholders for this project, each with a specific role in the successful implementation. Stakeholders with decision authority included organizational leadership, physician leadership, and unit nursing leadership. Operational stakeholders included a nurse educator, staff nurse, nursing assistant, provider representative, supply chain, ancillary staff representative, and a patient and family member (Kogon et al., 2015).

Interprofessional Collaboration

Interprofessional collaboration was a theme noted throughout the literature review. Successful implementation and sustainability require interprofessional collaboration. Many challenges are faced when combining multidisciplinary professionals into teams; however, the "increased opportunities for new scientific knowledge, mentorship, and innovation can provide great rewards that will benefit patients, practice settings, organizations, and healthcare systems" (Harris et al., 2000, p. 52). Nurses, nurse supervisors, nurse educators, quality nurses, research consultants, physicians, dentists, infection preventionist, speech-language pathologists, supply services, and ancillary staff will be encouraged to participate in interprofessional teams. Nurses, nurse supervisors, nurse educators, supply services, and ancillary staff will serve as the interprofessional team for the proposed project. The project team consisted of six regular dedicated team members with ad hoc members invited as needed.

Project Sustainability

Sustainability endeavors initiate at the beginning of the project. Ensuring the correct stakeholders are in place and involved with the project is essential to the project's implementation, success, and sustainability (Kogon et al., 2015). Leadership support at the

interprofessional level promotes opportunities for sustainability through understanding of organizational culture and potential or real practice concerns.

The Advancing Research and Clinical Practice Through Close Collaboration (ARCC)® Model was utilized to sustain the organization's evidence-based practice changes. A vital factor of the ARCC® model is the use of EBP mentors. The EBP mentor promotes the culture change to sustain the practice change (Melnyk & Fineout-Overholt, 2018). The unit charge nurses were identified to serve as EBP mentors. In addition to the EBP mentors, nurse champions on various shifts were acknowledged for their support as change agents and encouraged to inspire staff and peers to continue implementing the practice change. Quarterly updates of the implementation impact and continued training as scheduled by the nurse educator support the continued sustainability of the practice change.

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Level of Systems Change

The proposed practice change will create a micro-system-level change. A micro-level change occurs on a small scale (Melnyk & Fineout-Overholt, 2018). The intervention will occur

on one oncological medical-surgical unit at the organization. Although the project will be

implemented on one unit, the findings of the smaller practice change is intended to impact the

larger macro system of the organization and improve the delivery of patient care and outcomes

as the lessons learned during this pilot will be applied to the larger organizational rollout (Harris

et al., 2020).

Implementation Process with Timeline and Budget

The JHEBP model's PET process three phases guided the clinical inquiry through the

development of a focused practice question regarding the effectiveness of oral care bundles or

protocols to reduce NV-HAP. The literature synthesis provided support for intervention, and

finally from the synthesis the best-practice evidence was operationalized into practice. This

framework informed the overarching premise of this pilot project, and blended with the chosen

change model, Kotter's 8-Steps for Leading Change.

The project is approached through the lens of phases of activity: preparation,

implementation, evaluation, and dissemination. Through these four phases the 8-steps are

interspersed to guide the process within each phase. (See Figure 2). During each of the phases

project milestones were achieved which signaled the movement into the next phase. The project

occurred over approximately 47 weeks from draft to dissemination, aligned with academic

program requirements and phasing which led to embedded project pauses. Once the

implementation phase was achieved the pilot lasted six weeks, with two weeks dedicated to

primary training and four weeks to measure adherence. This phase was followed by evaluation

of the results and internal and external dissemination of the project findings. A project schedule

can be found in Appendix C.

The ability for the pilot project to success is dependent on appropriate resource

allotment (Dang & Dearholt, 2017). The steering committee evaluated the pilot project and

determined that the pilot had limited expenditures and would not encounter financial barriers for

success. The project manager ensured that the intervention did not require additional staff

hours; all oral care bundle training was performed during staff scheduled working hours. The

minimal costs associated with the pilot project included the cost of making copies of the oral

care policy for each employee during education sessions, laminated check-off sheets for each

computer and questionnaires supplied to staff for feedback. The oral care products are already

a part of the patient admission supplies. The project budget is found in Table 1.

Table 1

Oral Care Protocol Implementation EBP Project Budget

Expenses		Revenue	
Indirect- Included in regular operating costs	est. $3750	Billing	$unknown
Salary and benefits x 1 hour for training, variable staff.	$15-75/hr x ~75 staff	Supplies/ patient	$unknown
Supplies x 1 patient/ day, variable patient count	$5 x ~ 75 patients/ day	Grants	0
Overhead	$0		
Supplies – office	$<100		
Estimate Total Expenses	$3850	Estimate Total Revenue	0
Net Balance			$NA

Note: All budget entries are estimates. Expenses are based on means. Revenue estimates do

not include potential cost avoidance due to prevention of NV-HAP. All costs associated to salary

and benefits, patient care supplies, and overhead are fixed indirect expenses not associated

with this project. Project costs are nominal for printing and laminating, under $100.

Clear, measurable project objectives guided the implementation and evaluation of the

process change. The project steering committee concluded that an overall 80% adherence rate

would be obtainable with the practice change. From there the project manager developed in

association with the pilot unit leadership three specific objectives for the project. This was a

highly meaningful exercise as the facility did not have a pre-existing measure set for NV-HAP or

associated quality metrics related to prevention activities.

Objective One

The percentage of patient oral care adherence with one or more episodes of oral care per patient day by staff and patient report will be ≥ 80% at the completion of the six-week pilot project.

Objective Two

The percentage of patient oral care education received during the episode of care (admission) by staff and patient report will be ≥ 80% at the completion of the six-week pilot project.

Objective Three

The rate of discrepancy of documentation of oral care in the nurse-patient care notes and self-reported oral care received from the patient will be less than ≤20% at the completion of the six-week pilot project.

Preparation Activities

It is essential for all projects to begin with preparation activities. Utilizing Kotter's 8-step change model, the components of the change model in this phase includes creating a sense of urgency, building a guiding coalition, form a strategic vision and initiatives, and finally, enlist a volunteer army.

The organization's leadership were called to action in 2019 but delayed due to resource constraints, yet a renewed sense of urgency resurfaced mid-2021 when the potential for a pilot program for improving oral care was identified. As an enterprise-wide goal, this initiative met several markers of need: there was evidence that supported the change, baseline data from auditing affirmed inconsistency of practice, and of most importance, a basic care need that had the potential to impact the patient's experience was lacking. The project had both unit level and operational support to ensure that the pilot project was resourced. This enthusiasm generated a sense of urgency that moved the pilot from a discussion to the planning phase.

The interprofessional team called together to address the needs of the project informed the next step by building a guiding coalition. This coalition was charged with understanding the

project and assisting in the determination of resources related to staffing, supplies, and financial

considerations. As the essential stakeholders for this project, the guiding coalition, now referred

to as the project steering committee, assisted in the development of the overall pilot objectives,

coordination of activities led by the project manager, and communication strategies, working

together towards their common goal and vision to create an action plan that would answer the

evidence-based question.

The project's leading vision was informed by the PICOT question as approved by the

organization's leadership. Specific objectives, thresholds, and functions were informed by the

project steering committee, which included commitment to the staff training allotment, obtaining

and distributing programmatic documents such as brochures and handouts, and patient

education materials. The strategic vision from the enterprise was scoped for the individual

organization and then again restricted under the terms of a pilot implementation.

Through the use of a pilot initiative the project is able to be implemented fully in a micro

system to understand any barriers and benefits found within the pilot project. These benefits are

then translated to the larger strategic vision for the organization and any barriers identified are

broken through this function.

Change cannot occur unless all members of the team are aligned with the vision of the

new state created by the team. Change is not effective if it is only pushed from the top down as

key stakeholders and true representation of practice in the environment are missed in the

development and implementation of the project, as a pilot or a larger change. The steering

committee's support for this change was an essential step to move forward, but the recruitment

and development of unit champions for the new project paradigm became the volunteer army

who assisted the project manager in operationalizing the change at the unit level. By utilizing

unit champions as members of the project teams the *why* of the change became the message

at the forefront to those that required to update their practice to the established standards,

whether to improve existing practice or begin new processes. The utilization of unit champions

for the successful development of a pilot change with the intent to move into an organization

change cannot be understated (Miech et al., 2018).

Implementation Activities

Prior to project implementation, the project manager secured all necessary approvals at

the university and facility levels. The University of St. Augustine for Health Sciences Doctor of

Nursing Practice Evidence-Based Practice Review Council (EPRC) and the facility's Evidence-

Based Practice and Research Council (EPRC) granted full approval.

In the implementation phase activity within the pilot project is centered on knowledge

translation and practice change occurs. This phase is heavily reliant on effective communication

begun in the planning phase and highly emphasized in the implementation phase. The change

process is ineffective unless all individuals within the change process from leadership to the

patient are aware of the elements of change related to the elements of *who*, *what*, *when*, *where*,

and most importantly *why*. This phase began by solidifying the change process introduced in the

planning phase in the direct care providers on the pilot unit. As this change process was

communicated to the employees in an open manner, they became empowered to provide

feedback throughout the implementation. This promoted a sense of inclusion and ownership of

the change. Short-term wins acknowledged and praised in the moment and reinforced in daily

team huddles further encouraged positive promotion of change, reduced resistance and moved

more individuals to the new state. Finally, the communication loop continued with pilot project

updates at regular intervals that provided both the short-term gains and discussion of the

barriers experienced by the direct staff to have a continuous improvement process during this

pilot.

After identification of potential barriers, the implementation process was developed to

assist with barrier removals. The kickoff to the implementation phase occurred over the first two

weeks to complete staff competency and skills training to ensure understanding of essential

elements of the oral care bundle implementation. This also provided an opportunity to gather the

immediate pre-implementation data to compare to the initial needs assessment pre-implementation data. The two week training event was phased with two approaches and occurred in four groups, two groups during the AM shift and two on the PM shift, to ensure all staff members received appropriate training with limited interruptions to the normal work schedule.

Week one utilized the interprofessional team to address the elements of the standard operational procedure and algorithm with the pilot unit nurses and nursing assistants. This was offered in over several sessions based on the grouping to accommodate scheduling, and training materials were distributed and posted on the unit. (See Appendix D). The review included content related to oral care frequency, tools, and products used through case studies and patient scenarios. This type of training was deemed essential as when there is a gap in the knowledge of the protocol care is missed; by establishing an expectation of care through a protocol improvement in patient care and outcomes are operationalized for the direct care provider. (Baker et al., 2019; Chipps et al., 2016; McNally et al., 2019; Munro & Baker, 2019; Pai et al., 2019; Pritts, 2020; Warren et al., 2019).

In week two the training had two points of purpose: patient education and appropriate documentation of oral care activities. The interprofessional team began by shifting the educational focus from the staff role related to the process steps to having a solid knowledge based to allow the nurses and nursing assistance to address patient needs through a consistent message and patient education program. When the benefits of oral care are consistently messaged there is positive correlation to patient adherence to the oral care activities. Mixed media utilized for this patient education beyond direct communication between the patient and nursing staff include pamphlets, brochures, and videos. (Baker et al., 2019; Munro & Baker, 2019; Pai et al., 2019; Pritts, 2020; Warren et al., 2019).

For the pilot project the patient education program included materials approved by the organization for distribution to the patient, including *The Brush Your Teeth to Prevent*

Pneumonia brochure and handout. The education begins immediately as the patient's

experience begins with the admission process includes the handout with all new patient

information and registration packets and then the brochure is utilized by the nursing staff to

guide the conversation during the admission process. Nurses and nurses' assistants continue

reinforcement of the materials by referencing the brochure during the day and night shifts oral

care rounding.

The final point of week two's training focused on the correct process for documenting

oral care interaction correctly in the EHR charting system. The oral care documentation training

was completed by the interprofessional team subject matter experts and was presented to each

group, nursing and nursing assistants, to provide focused education based on role as the two

roles interact with the record in a different manner. Customizing the training to the content

appropriate for the role maintained attention and have ensured that the details were relevant

and meaningful. Training documents were made available to each employee via print and

electronic means via secure access.

Between weeks three and six the nursing and nursing assistant staff members

implemented the oral care standard operating procedure, referred to as the oral care bundle.

The steps are outlined in Appendix D. Throughout the pilot the unit champions were present to

complete observations of practice, monitor adherence to documentation standards, and

complete patient rounding activities to understand the patient's perspective of receipt of

education and understanding of the oral care need. This supported the employees during the

pilot period and provided opportunities for bidirectional feedback and the sense of ownership of

practice.

The process began with the admission clerk's initial contact with the patient emphasizing

the oral care handout in the admission packet (see Appendix E). This initial contact patient

conversation that introduced the basic concepts and key advantages of oral care as a

preventative measure for reducing pneumonia while hospitalized set the expectations that the

care team would be engaging the patient in further education and care provision. Next, the admission nurse continues to educate the patient on the expected process, tools, and products available, and appropriately documents the encounter in the oral care component of the EHR. The patient's individualized care requirements are addressed based on the patient's medical status, and determined through the algorithm in the oral care protocol standard operating procedure. Continued patient education is completed utilizing the oral care brochure which expands on the content from the oral care handout (see Appendix F). The patient's individualized education includes ordered frequency of oral care and the location of products available to the patient. An initial assessment of the level of assistance required to perform the oral care tasks is completed upon admission and captured in the oral care documentation, and during the minimum twice daily oral care interactions (AM and PM shift) the nurse or nursing assistant documented the patient's status related to independence, assistance, completion of oral care.

Throughout the pilot period, daily staff huddles reinforced the practice change highlighting successes and addressing reported or observed barriers. During the oral care interactions, provided at a minimum of twice daily, the necessary equipment for care included a soft bristle toothbrush, fluoridated toothpaste, antiseptic mouthwash, and specialty equipment for patients at risk for aspirations and/or those with dentures. Identified patients with willingness to receive care, but needing assistance, were provided the assistance and reinforcement of the importance of the oral care.

Results

The organization's ultimate goal with the pilot project was to ensure all benefits were obtained and all barriers addressed prior to the launch of a larger scale implementation of the oral care bundle to reduce the potential for infection for NV-HAP in adult inpatients. To do so each of the elements identified during the initial assessment had to be understood and surveilled for adherence to the updated standards of the oral care protocol. The surveillance

plan included gathering data from the patient and from the electronic documentation for comparison.

Initial data collection to determine if a care gap existed occurred in 2019. This data was reassessed for reflection of current practice prior to the beginning of the project implementation. This data was data was collected by unit leadership through EHR audits to understand the reported frequency of care provision and accuracy of care documentation. This became the baseline for comparison

To understand the patient's perspective on the function of the oral care protocol, a member of the interprofessional team or unit champion completed surveillance rounding throughout the pilot. Each patient was asked the same three questions during the rounding which occurred during AM and PM shifts:

1. Are oral care supplies available?

2. Was oral care completed/ received?

3. Did a member of the nursing staff (nurse or nursing assistant) assist with oral care?

4. Was education on oral care provided?

This data was collected using an internally developed standard data collection tool exhibited in Appendix G, that allowed the interprofessional team member to collect data in a reliable manner no matter whom or when the rounding was completed. Additional data representing the documentation of the oral care provided was retrieved in an aggregate manner for the pilot project period by the nurse education manager and presented to the project manager for analysis.

Following data collection, the pre-intervention and post-intervention data were evaluated to determine of the three specific project objectives were met and subsequently the outcome of the PICOT question. The project's specific objectives included increasing the rate of patients receiving oral care to ≥80%, increasing the rate of patients receiving oral care education to

≥80%, and decreasing the discrepancy of oral care documentation in the nurse-patient care

notes and self-reported oral care documentation care received from the patient.

Table 2

Oral Care Completion Surveillance by Documentation Audits by Patient Care Days.

Month	N	Instance of oral care received per day [a]		
		n = 0	*n* = 1	*n* ≥ 2
Baseline				
July 2021	854	842 (98.59%)	12 (1.4%)	0 (0.00%)
August 2021	864	574 (66.43%)	155 (17.93%)	135 (15.62%)
September 2021	760	243 (31.97%)	249 (31.05%)	268 (35.26%)
October 2021	792	235 (29.67%)	236 (29.79%)	321 (40.53%)
Intervention				
December 2021	804	233 (28.98%)	258 (32.08%)	313 (38.93%)
January 2022	679	208 (30.63%)	234 (34.46%)	237 (34.90%)

Note: Patient care days calculated by number of patients present during midnight patient

census. A single patient's admission episode may have a patient day count of 0 to 30 or more

patient days depending on the length of stay of the individual patient. Observations

Note: *N* = patient care days calculated by number of unique patients present during midnight

patient census. An episode of care per identified month may have multiple patient care days. *n*

= unique patient care day within an inpatient episode of care. % = total observation per category

/ total patient care days per month observation period.

[a] Reflects results as determined by documentation audits presented in aggregate.

As presented in Table 2, the pre-intervention data, identified as baseline, was gathered

during the months of July 2021 through October 2021. Data analysis included rate of

documentation of oral care completed per patient day. Table 3 displays analysis of the

percentage of completed oral care education during the episode of care during the same pre-

implementation timeframe.

Table 3

Percentage of Oral Care Education Completed During Inpatient Episode of Care

Month	Volume	Oral care education completed during episode of care [a]	
	N	*n*	*%*
Baseline			
July 2021	209	91	43.54%
August 2021	228	158	69.30%
September 2021	223	195	87.44%
October 2021	223	204	91.48%
Intervention			
December 2021	225	188	83.56%
January 2022	179	163	91.06%

Note: *N* = patient episode of care per identified month with totality of episode of care regardless of length on a single encounter equating to one episode. *n* = unique patient episodes within total of patient episode of care per month with documentation of oral care education completed during episode of care.

[a] Reflects results as determined by documentation audits presented in aggregate.

The analysis of the pre-implementation data supported the need for improvement of provision of oral care, documentation of oral care, and provision of education related to oral care. Variable rates in both data sets did show improvement month over month during the pre-implementation surveillance time, which may be the result of unintentional confounding during the collection of data, as pre-implementation readiness was in progress.

Project kickoff occurred 12/13/2021 with two weeks of training as described above. The implementation of the oral care bundle was initiated on 12/27/2021 and post-implementation data collection concluded 1/23/2022 for the pilot project.

Data from the EHR was provided to the project manager in aggregate for analysis. This report was generated by the nurse educator manager and required appropriate role security to ensure privacy protects and information security were maintained. Due to reporting constraints

the data set included all days of December without the ability to separate data into planning,

training, and implementation rating. The data for January was able to be retrieved on the last

day of data collection and is accurate through 1/23/2022.

Analysis of the post-intervention data showed improvement in provision of oral care with

a greater volume of patients receiving at one or more episodes of oral care per patient day,

although the percentage of patients receiving two or more episodes of oral care per day peaked

during the pre-implementation phase and remained consistent through the implementation

phase. This trend is also reflected in the patient education per episode of care (admission).

The unit benchmark of ≥80% patients receiving oral care at least once a day per patient

day, and ≥80% receives oral care education during the episode of care was set by the facility.

The once-a-day oral care benchmark was not achieved during the project as in aggregate only

71.71% of patients received oral care per patient days. It must be emphasized that this is a

noteworthy improvement, however, from the benchmark period of an aggregate of 42.07% of

patient received oral care one or more times per patient day. This represents an increase of

70.45% in oral care provision. The benchmark for patient education was met, with an aggregate

improvement from 73.38% to 86.88% post-implementation. This represents an 18.39% increase

in oral care education provided during each episode of care. In concert with the improvement of

the provision of oral care and education, there was a marked improvement in the documentation

of both metrics. In aggregate the pre-implementation data where no documentation was present

for oral care delivery or education (an assumption of incomplete tasking) the percentage of no

oral care per patient day was 57.92% and oral care education per episode of care was 26.61%.

Both metrics improved with deficiency in oral care provided per patient day at 30.35%, a 47.60%

decrease, and oral care education per episode of care at 13.11%, a 50.73% decrease.

The data for the project presented in aggregate from the facility's EHR. This report was

generated by the unit nurse educator and required appropriate role security to ensure privacy

protects and information security were maintained.

Impact

Implementing the project's oral care bundle, which included reinforcing an oral care decision-making protocol, staff training and competency assessment, patient education, and proper documentation training, addressed each element of the facility's initiative to improve oral care. The project answered the evidence-based practice question. As a result of the oral care bundle, the pilot project unit exhibited an increase in oral care one or more times per patient day, education per patient episode of care, and improved clinical documentation.

Clinical significance of the project is highlighted through the implementation of a cost-effective back-to-basic's care process aimed at preventing NV-HAP through the improvement of oral care for adult inpatients in the pilot unit. The data demonstrates the use of effective communication, training to competency, clear processes, and access to required resources improve the provision and documentation of care. Through interprofessional team approaches the *why* was emphasized in addition to the *what* and the *how*. Use of unit champions, daily huddles, and celebration of quick wins empowered staff to own the change process. Utilizing a pilot implementation identified benefits and barriers of the process within the uniqueness of the facility's culture and provided opportunities for focused improvements before large scale implementation.

Beyond the metrics, the patient engagement with the process as active and autonomous decision makers capable of informed decision making increased through this multipronged approach to this practice concern. Engaging the patient and their support system from the beginning as stakeholders in the process, to individualized plans of care promoted from admission to discharge became impactful in a short amount of time as evidenced by the improvements across all metrics.

Sustainability and Ongoing Evaluation

The support of the stakeholders influenced the sustainability of the project. The goals for the project were based on the benchmarks set by the facility. After the project implementation,

project tools continue to be used on the unit. An adherence surveillance program was operationalized to monitor the performance of oral care at a minimum of a monthly basis. Through active surveillance and continued reinforcement, any noted deviation of practice expectations will be addressed individually or as a whole unit. New employee onboarding and competency based orientation program has been updated to include as a required competency. In addition to the EBP mentors, nurse champions on various shifts were acknowledged for their support as change agents and encouraged to inspire staff and peers to continue implementing the practice change. Quarterly updates of the implementation impact and continued training as scheduled by the nurse educator are operationalized in an effort to continue sustaining the gains seen in this pilot implementation.

Future Recommendations and Limitations

Limitations of the project included staffing considerations due to attrition and planned and unplanned absences. Due to competing priorities and requirements for providing direct patient care, the communication strategy engaging unit leadership as champions of the change was limited, although others filled the gap. Future project implementations for new practice bundles are recommended to have increased awareness of competing priorities during the implementation period and an extended implementation period to allow for normalization of the process without variances due to attendance concerns.

<center>**Dissemination**</center>

Internal dissemination of project results occurred at the interprofessional department leadership level where the project manager reported the pilot project outcomes to medical and nursing leadership, and to additional stakeholders, including direct care providers. Dissemination included outlining key steps, data analysis and outcomes, lessons learned, and future considerations for expansion and sustainment. Further, to augment this information session, a poster highlighting key process steps, quality drivers, and associated outcomes was placed in a communal space for review by all staff members. An executive summary of the

project and critical findings was developed and presented to the division of nursing education representatives for review in the Evidence-Base Practice and Research Council and incorporation into the standard onboarding orientation for nursing staff members.

External dissemination was completed through two oral poster presentations, one with academic peers and faculty, and one at the Alpha Alpha Alpha Chapter of Sigma Theta Tau International at the University of St. Augustine for Health Sciences DNP Scholarly Project Symposium. Manuscript publication to the Scholarship and Open Access Repository (SOAR) at the University of St. Augustine for Health Sciences, a public online repository that showcases the scholarly work produced by the University's students, faculty, staff, and alumni.

Conclusion

Oral care is a cost-effective, and proven, approach to the reduction of risk of NV-HAP in the adult inpatient setting. Although it may seem to be a basic, or even a simple, concept, oral care can significantly impact patients' health and wellbeing, improving patient specific outcomes through risk reduction, and decreasing the overall cost associated to an episode of care.

Often overlooked, this basic care process approached as part of a comprehensive bundle supporting consistent, yet individualized, patient care delivery, significantly reduces the risk of NV-HAP. The evidence supported the utilization of oral care bundles or protocols, and clearly identified the risk to patients and the healthcare system on local and national levels when oral care practices are neglected. Consistent oral care practices are proven to be the only intervention to reduce NV-HAP successfully. The practice change project strove to effectively implement an oral care protocol on a pilot unit to guide best practices to improve oral care and ultimately maintain a low to no NV-HAP rate at the participating tertiary acute care facility through translation of evidence-based practice. At the pilot level the project provided evidence of change and guided through lessons learned the next steps to operationalize the change at the organizational level.

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Figure 1

PRISMA Literature Search Strategy Diagram
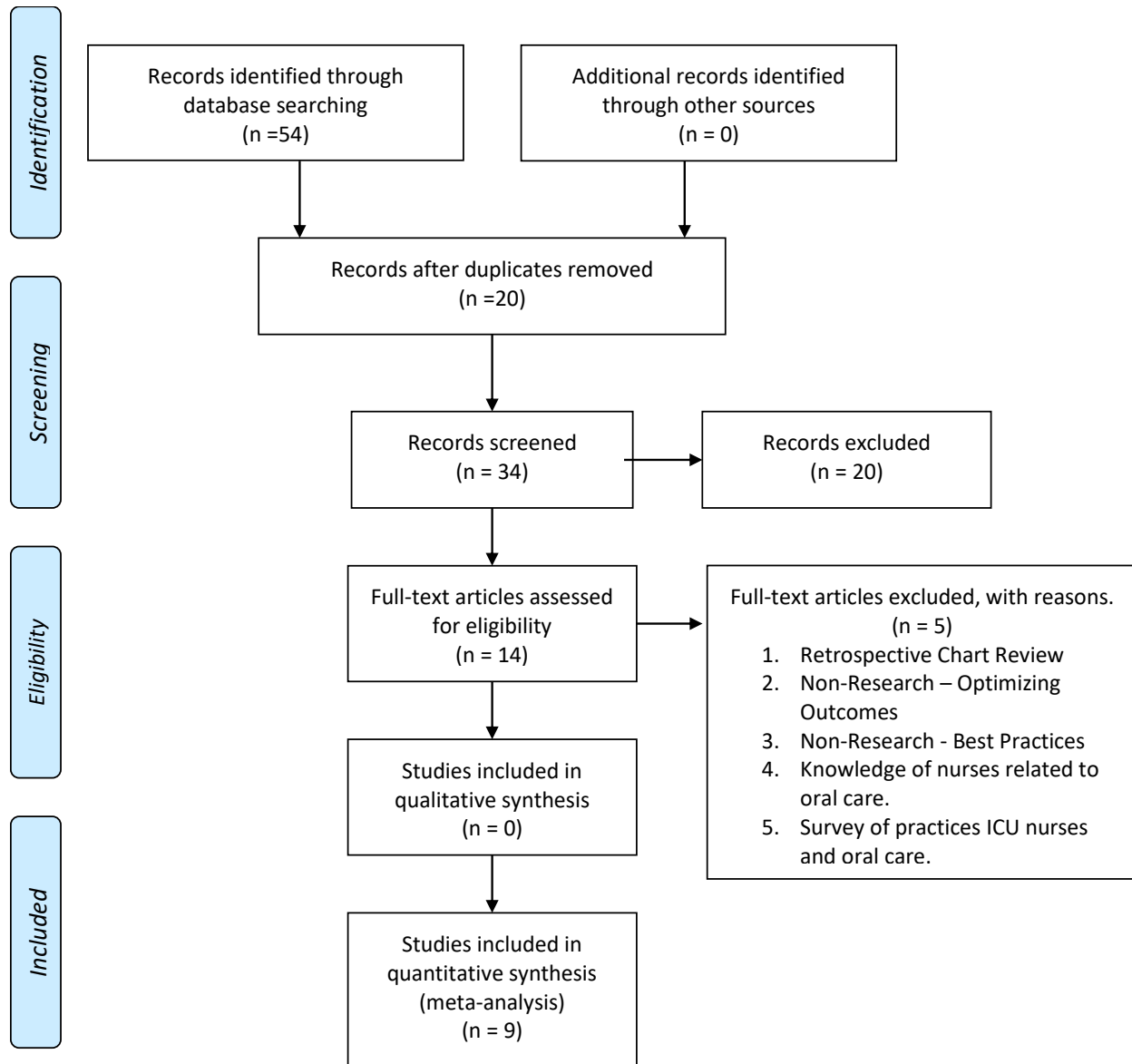
Note: Adapted from: "Preferred Reporting Items for Systematic Reviews and Meta-Analyses:

The PRISMA Statement," by D. Moher, A. Liberati, J.Tetzlaff, and D. G. Altman, *PLoS Med 6*(7):

e1000097 (doi:10.1371/journal.pmed1000097). Copyright 2009 by The PRISMA Group.

Figure 2

Four-Phase Implementation Approach Using Kotter's 8-Steps for Leading Change Model

- **Preparation**
  - Creating a sense of urgency
  - Creating a guiding coaltion
  - Developing a vision and strategy

- **Implementation**
  - Empowering broad-based action

- **Evaluation**
  - Generating short-term wins
  - Consolidating gains and producing more change

- **Dissemination**
  - Anchoring new approaches to the culture
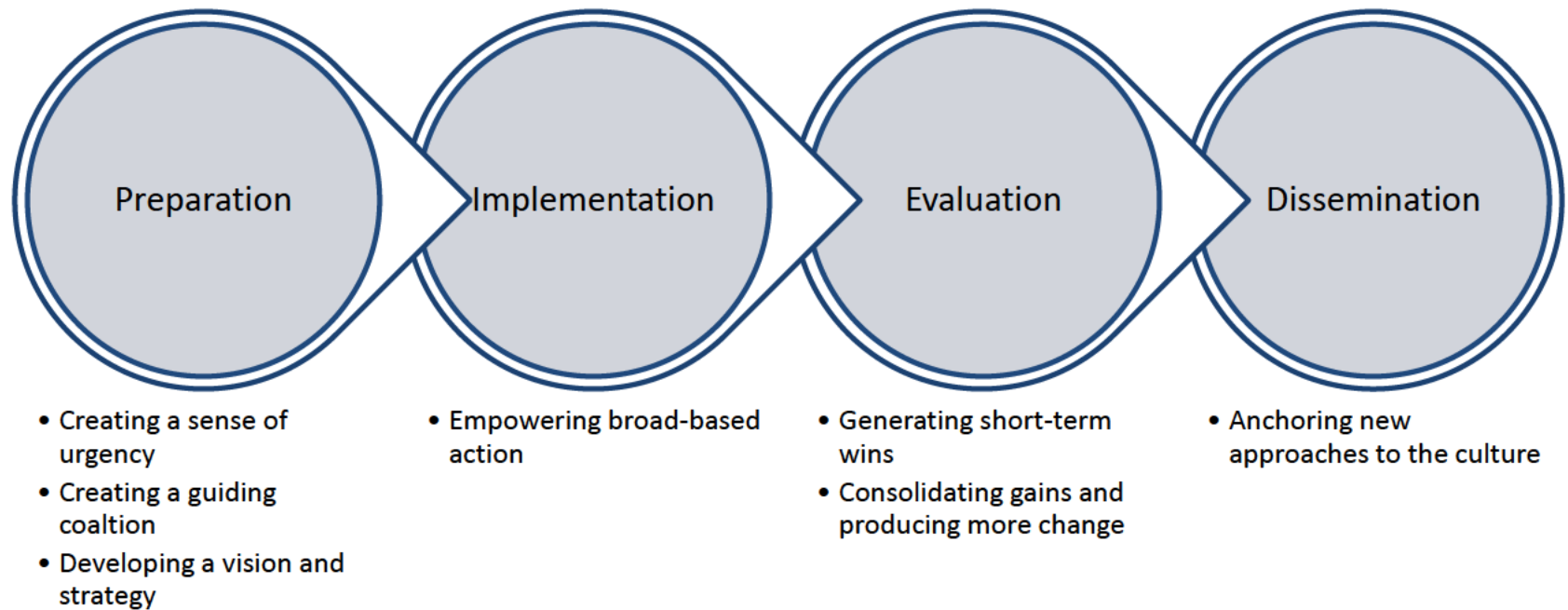
Note: The eight steps of change are listed in order of completion grouped by the four phases of the pilot project development.

Appendix A

Summary of Primary Research Evidence

Citation	Design, Level Quality Grade	Sample Sample size	Intervention Comparison	Theoretical Foundation	Outcome Definition	Usefulness Results Key Findings
Alja'afreh, et al., 2019.	Level II Grade A	Pts on a mechanical ventilator in intensive care units (ICU) - 1 large teaching hosp from the Jordanian capital and two hosps from the southern region – Sample size – 218	Intervention Group (n=102) – Nur provided OC following protocol - nur, using an OC protocol - (1) brushing pts' teeth three times a day (at the beginning of each shift); (2) swabbing the pt's teeth, tongue, and hard palate using antiseptic mouthwash (0.05%) every 6 hours; (3) lubricating the pt's lips every 6 hours; and (4) performing mouth and pharynx suction every 2 hours or when needed. Control group (n=116) – Nur provided mouth and pharynx suction at least every 2 hours and moisturizing pts' lips at least once every shift.	Higher risk of patients developing infections when OC is not performed. There is a lack of adherence to implementing OC protocols	The effect of launching OC protocol on the rate of VAP	Statistically sig between the intervention and control group. 25.5/1000 compared to 48.3/1000 cases of infection. ICU stay and intubation the period was sig shorter in the intervention group compared with the control group
Baker, et al., 2019.	Level V Grade A	523-bed, community medical center, located in a large metropolitan city, with an average of	Hosp-wide intervention – OC protocol - HAPPI protocol included	Pts not on a ventilator acquire pneumonia more	Reduce and sustain a reduction in NV-HAP	Achieved a statistically sig reduction ($P = .01$) in pneumonia rates that have been sustained over four years.

		27,000 admissions per year – Implemented for four years	Four times daily t-brush with toothpaste containing a dentifrice, followed by an oral rinse with antiseptic mouthwash, using suction t-brush for patients at risk of aspiration, and **OC** for **pt**s with dentures.	than pts on ventilators – gap analysis determining need for enhanced OC policy	cases.	Sustaining change requires (*a*) a continued team-based, collaborative approach, (*b*) ongoing stakeholder and executive leadership engagement, (*c*) monitoring those easy-to-use protocols and required equipment remains in place, and (*d*) embedded analytics to monitor results over a prolonged period.
.	Level I Grade A	Recruited from - 44-bed surgical ICU, a 25-bed medical ICU, a 14-bed medical ICU and 30-bed cardiac surgical unit Sample size – 85 – 74 Randomized	Intervention Group (23) - tooth brushing, tongue scraping, flossing, mouth rinsing, and lip care. Control group (41) usual care Revised THROAT. The R-THROAT, an instrument that measures oral health, includes seven areas: lips, gums, teeth, tongue, saliva, smell, and mouth comfort.- valid and reliable instrument to assess the oral cavity score weighted kappa.95–.97 To assist with reliability, intraoral photographs were taken of the oral cavity on Day 1 and Day 4.	OC is best practice to prevent HAI, but less attention is paid to OC – develop an E.B. OC protocol and determine the impact on recently extubated pts	Assess the effect of an OC protocol on (1) Measures of oral health, (2) Rate of oral colonization with methicillin-sensitive S.A. (MSSA) and MRSA, and (3) Pt satisfaction with in-hosp OC.	Both groups showed improvement in the total health of the oral cavity over time. However, the intervention group demonstrated sig more improvement than the usual care group

McNally et al., 2019.	Level III Grade A	450-bed, inner city, Level 1 trauma center. 5,306 subjects were enrolled. After the exclusion Criteria, 2,891 subjects remained	The experimental group (n 1,403) -Three times a day brushing teeth and gums for 1–2 minutes, removal and cleaning of dentures if present, and discarding toothbrush after a single-use Control group (n 1,487) - usual care.	Effectiveness of aggressive OC in reducing HAP in non–intensive care wards	The efficacy of an aggressive OC initiative, focusing on t-brush, a simple and inexpensive intervention, to reduce the rate of non-ICU, non-VAP at a tertiary care medical center.	No sig difference in pneumonia rates between control and experimental groups was found T-brush rates increased sig in the experimental group but fell short of protocol frequency T-brush program implementation requires nursing-led interdisciplinary involvement, intensive training, a streamlined documentation system, and efficient compliance tracking.
Munro, et al., 2018.	Level I Grade A	Pts 18 and over admitted to 8 ICUs who have been intubated less than 36 hr, and are currently mechanically ventilated Sample size 345	Intervention group – divided to receive brushing once, twice, or three times a day - brushes all tooth surfaces, gums, and tongue with a soft pediatric toothbrush, using dry mouth toothpaste, for 2 min per intervention Dental plaque assessment - University of Mississippi Oral Hygiene Index (UM-OHI) - Compared against conventional visual assessment methods in subsidiary analyses to evaluate potential greater reliability and validity in scoring of oral health	Frequency of tooth brushing in the critically ill has not been experimentally determined	1. Determine the optimal frequency of t-brush for mechanically ventilated adults 2. Quantify and compare the safety of three-tooth brushing frequencies 3. Investigate pt factors that influence tooth brushing frequency	Optimal tooth brushing promotes pt comfort, improve the efficiency of nursing care, and may reduce systemic sequelae related to oral inflammation

			Gingival crevicular fluid (GCF) - well-developed dental research methodology dating to the 1960s			
Munro, et al., 2018.	Level IV Grade A	Veterans Health Administration (VHA) - Community Living Center (CLC) units, the first V.A. pilot site. Houston VAMC (2nd V.A. pilot site),	Intervention – Staff education, OC intervention - OC assessment by a a registered nur, (b) Veterans who were able to brush their teeth received needed supplies and gentle encouragement to complete their OC (c) brushing the teeth of the Veteran who needs assistance with a soft ADA approved toothbrush and toothpaste, (d) use of a suction toothbrush for Veterans at high-risk for aspiration, and (e) complete documentation of OC provided.	Providing consistent OC, 2 to 4 times a day, may decrease the risk of NV-HAP by 40–60%	Determine the effect of a twice-daily OC initiative on the incidence and cost of NV-HAP.	(NV-HAP) - decreased from 105 to 8.3 cases per 1,000 pt days (by 92%) in the first year. The intervention yielded an estimated cost avoidance of $2.84 million and 13 lives saved in 19 months post-implementation. Barriers to OC include: (1) the perception that OC is an optional daily care activity for pt's comfort, (2) hosps supply inadequate, poorly designed OC materials, and (3) hosps are not required to monitor the incidence of NV-HAP
Pai et al., 2019.	Level I Grade C	Participants will be recruited from pts admitted in radiation oncology and special wards of a tertiary care hosp in India = 70 pts 25 staff nurs will be taken using enumerative sampling technique.	Intervention group will receive the OC protocol Control group - routine OC as per the standard of care of the hosp	Occurrence of mucositis can cause many severe and disturbing events in oncology. OC is one of the most neglected areas in nursing.	Incidence of oral complications and oral health assessment.	Staff nurs had poor knowledge regarding OC of cancer pts, did not perform OC as a part of routine duties

| Pritts, 2020. | Level V Grade A | Two non-intensive care units (24-bed medical-neurology unit, 18-bed medical-surgical unit) within 413-bed, not-for-profit teaching hosp | OC policy based on specific pt type – equipment, procedure, frequency | Organization do not provide nursing staff with guidance on the frequency of OC, oral care protocol, appropriate supplies,

Researchers have found implementing a nur-led OC initiative reduced NV-HAP incidence by 40%-60% and saved the organization $1.7-2 million over one year | OC documentation audits tool to collect age, gender identity, length of stay, discharging unit, type of OC provided, frequency of OC, and level of needed assistance • Incidence of NV-HAP based on discharge diagnoses from the EMR | Documentation of oral care increased from 21% to 78% on the medical-surgical unit, and from 15% to 44% on the medical-neurology unit.

The LOS was higher among pts who were not provided OC then those who received OC twice daily.

Pts who required support or total care for OC was less likely to receive OC than independent pts (68% and 73%, respectively).

Additional research on the benefits of OC needs to be done to decrease these barriers as they may influence pts' overall health outcomes |
|---|---|---|---|---|---|---|
| Warren et al., 2019. | Level V Grade A | All adult in-pt care areas at a level 1 trauma hosp

202 pts in the baseline group and 215 in the intervention group | Evidence-based OC protocol algorithm | Observed inconsistencies in delivery of OC, and staff perceptions of pt dissatisfaction with OC products, develop a feasible evidence-based protocol for bedside nurs. | Implement an OC protocol in the adult in-pt care areas of a level 1 trauma hosp and to evaluate its impact on the incidence of HAP | Statistically sig decrease in occurrences of NV-HAP

Providing oral health interventions improved pneumonia outcomes, reduce overall hosp costs, length of stay, and pt mortality. |

Legend: HAP = hospital acquired pneumonia; hosp = hospital; nur = nurse(s); OC= oral care; pt(s)= patient(s); sig = significant(ly);

t-brush = toothbrush(ing).

Appendix B

SWOT Analysis

STRENGTHS	WEAKNESSES
1. Highly skilled clinical staff 2. Leadership support 3. Equipment/Supply availability 4. Education material	1. Scheduling staff for training 2. Lack of current adherence 3. Lack of policies, procedures, guidelines 4. Current training procedure
OPPORTUNITIES	THREATS
1. Multidisciplinary team 2. Online/At-Home Training 3. Patient engagement 4. Compelling scientific evidence	1. Turnover 2. Infectious disease outbreak 3. Leadership change 4. Low census

Appendix C

Project Schedule

Activity	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 17	Week 19	Week 21	Week 23	Week 25	Week 27	Week 29	Week 15	Week 31	Week 33	Week 35	Week 37	Week 39	Week 41	Week 43	Week 45	Week 47	Week 49
Project Mentor Meetings	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Preparation Activities		▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓														
P1- Background Data Analysis		▓																								
P2- Stakeholder Analysis and Engagement			▓	▓																						
P3- Evidence Synthesis				▓	▓																					
P4- Project and Evaluation Planning					▓	▓	▓																			
P5- Academic and Institutional Approvals								▓	▓	▓	▓	▓														
Implementation Activities													▓	▓	▓	▓	▓	▓								
I1- Staff Training													▓	▓												
I2- Data Collection															▓	▓	▓	▓								
Evaluation Activities																			▓	▓	▓	▓				
E1- Data Analysis																			▓	▓	▓	▓				
Dissemination Activities																							▓	▓	▓	▓
D1- Internal																							▓	▓		
D2- External																									▓	▓

Appendix D

Standard Operating Procedure for an Oral Care Protocol

Standard Operating Procedure: Oral Care Protocol

Purpose: Brushing the teeth 2-3 times in a 24-hour period will help reduce the patient's risk of developing hospital acquired pneumonia and other health problems. Dental plaque and oral biofilm that contain bacteria (germs) is removed by tooth brushing and denture cleaning. It starts forming again quickly after removal and is considered fully "matured" about 12 hours after its first removal.

Frequency: Every 8-12 hours

Health Care Staff are responsible for:

- Preventing transmission of microorganisms: cleaning equipment, hand hygiene, gloves
- Preventing hospital acquired infections such as pneumonia by providing oral care

Equipment

- Gloves (see attached guidance document on personal protective equipment)

- Cup and basin

- Towel

- Toothbrush, American Dental Association (ADA) approved or other high-quality product*

- ADA approved fluoride toothpaste*

- Petroleum-free lip balm (optional)

- Alcohol free mouthwash* (optional)

- Mouth moisturizer (as needed)

- Dental floss or interdental cleaners (optional)

- Suction toothbrush, canister, tubing, and sterile water as needed

Procedure

1. Approach the patient at eye level, smile and establish rapport. Ask the patient for permission to assist with tooth brushing.

2. Perform hand hygiene, then collect and arrange the appropriate supplies within easy reach (e.g., on covered table or rolling cart).

3. Mouth care is best provided in a quiet environment with the patient standing or sitting in front of the bathroom sink which serves as a cue regarding the purpose of the intervention.

4. For those who cannot walk to the bathroom, position the patient in a chair or raise the bed to a comfortable working height. Raise the head of the bed to a semi-recumbent position and lower the side rail closest to you. A side-lying position may be used. Cover the patient's chest with a towel.

5. Perform hand hygiene and apply personal protective equipment (PPE).

6. Pre-rinse soft toothbrush with clean tap water. For patients requiring assistance, brush all the teeth beginning with the chewing surfaces using short strokes. Move slowly from one side of the mouth to the other side brushing all the upper and lower teeth. Gently brush front and back surfaces of all teeth in small circular strokes, including the gum line where plaque builds up easily.

7. In patients without a risk of aspiration, after the first step of dry brushing with tap water, apply a pea-sized amount of fluoride toothpaste to brush. Take care to brush all surfaces of the teeth.

8. Gently brush the soft tissues (tongue, roof of mouth, places where teeth are missing).

9. Assist the patient when rinsing with water and spitting or provide suction if needed.

10. Wipe the patient's mouth and apply petroleum-free lip balm to the lips.

11. Appropriately discard soiled linens and trash.

12. Store patient's personal oral care items.

13. Clean and disinfect the area as appropriate.

14. Return the bed and side rails to their original position.

15. Remove PPE and perform hand hygiene.

16. Report any problems or concerns.

17. Document care provided in the patient's record.

Denture Cleaning

Frequency: Variable, depending upon the condition of the dentures. Any visible signs of tartar on the dentures are an indication for the need of cleaning it. Dentures should be removed at night so the mouth can rest.

Equipment

- Gloves
- 9" x12" clear plastic bag
- Denture brush
- Liquid denture cleaner (or denture cleaning tablets)

Procedure – With gloved hands

1. Approach the patient at eye level, smile and establish rapport. Ask the patient for permission to assist with denture removal and cleaning.
2. Place dentures/partials in a 9x12" clear plastic bag.
3. Pour denture cleaner in the bag until the dentures are covered with solution.
4. Zip the bag shut and gently shake the bag to ensure all the denture surfaces are clean.
5. Line the sink with a towel to protect the dentures if they are dropped. Place the filled bag in the sink and soak for approximately 2 minutes.
6. Remove the dentures from bag, discard the cleaner down the sink, and throw the bag in the garbage can.
7. Under warm running water, gently brush all surfaces of the denture/partials. Remove all plaque and biofilm using a denture brush.
8. Rinse denture brush thoroughly so it may be reused.
9. Return dentures/partials to the patient. Place the used towel in the hamper.
10. Remove PPE and perform hand hygiene.

Things to remember:

- Discard the denture cleaning solution and bag after each use.
- Do not dilute the denture cleaning solution as it is ready for use, as is.
- Use denture cleaning solution with adequate ventilation.
- Denture cleaning tablets may be used instead of solution. Follow the manufacturer's instructions for use.
- If there is extensive tartar build up on the dentures that you cannot remove, contact the dental clinic for their assistance.
- Label and store oral care supplies in the cleanest, driest part of the patient's room.
- Toothettes and foam swabs are designed for application of mouth moisturizer and care of patients with no natural or false teeth. Toothettes and swabs should be discarded after one use. They are not a substitute for toothbrushing and denture cleaning.

Interventions for prevention of care resistant behaviors among patients with dementia:

- Simplify environment, explain procedures, and limit choices.
- Break down tasks into simple steps.

- Create privacy for self-care activities and use praise.
- Allow time for responses, introduce activities slowly, and do not force the patient.
- Maintain consistency of caregivers and a regular routine whenever possible.
- Ensure the patient is comfortable and provide a mirror when possible.
- Assume the patient understands more than he/she can express. Never talk as though the patient is not there or use "baby talk."
- Distraction may be useful e.g. singing, music, gentle touch, talking, offering a stuffed animal to hold.
- Bridging: give the patient the same object (e.g. toothbrush) to hold while you provide oral care.
- Hand over hand method: caregiver's hand is placed over the patient's hand to guide them through toothbrushing or denture removal/ replacement.
- The caregiver may start oral care by placing toothpaste on the toothbrush then place the toothbrush in the patient's hand so he/she can brush.
- Rescuing: the patient may be more receptive to another caregiver who resembles a friend or family member. The first caregiver leaves so the second caregiver can step in and help the patient.

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Note: Adapted from "Diffusion of Excellence, VA National Oral Care Implementation Toolkit:

Preventing Non-ventilator Associated Hospital Acquired Pneumonia by Engaging Nurses to

Complete Inpatient Oral Care (Internal VHA publication 2017, last revised October 2020)" by S.

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Munro.

Appendix E

Brush Your Teeth to Prevent Pneumonia Flyer #1

Note: Standard products for oral health campaign, 8x10 poster, item number IB 10-1354. From the U.S. Veterans Administration Oral Hygiene Care Share Point Database. Copyright 2021 by U. S. Veterans Affairs.

Appendix F

Brush Your Teeth to Prevent Pneumonia Brochure

Note: Standard products for oral health campaign, brochure, item number IB 10-1358. From the U.S. Veterans Administration Oral Hygiene Care Share Point Database. Copyright 2021 by U. S. Veterans Affairs.

Appendix G

Rounding Spreadsheet

Instructions: The unit charge nurse or designee will complete oral care surveillance rounds once per shift. Complete the rounding tool and submit to unit manager.

Legend:
Oral Care Order: mark Yes or No if oral care order is present in the patient order profile.
Supplies 0730-2000 or 1930-0800: Mark Yes or No if oral care supplies are present in the patient room during shift rounding.
Documentation of Pt Care Note AM or PM: EHR documentation review: Mark Not Observed/Asst if care note indicates oral care was not directly observed and no assistance offered; mark Not Observed/Edu if care note indicates oral care was not directly observed but patient education on importance/oral care process given/reinforced; mark Observed/Edu if care note indicates oral care was observed and patient education on important/ oral care process given/reinforced.
Pt/RN/NA: mark role providing data for collection

I.D.	Oral Care Order	Supplies 0730-2000	Documentation Pt Care Note AM	Supplies 1930-0800	Documentation Pt Care Note AM	Pt/RN/NA
Example	*Yes*	*Yes*	*Not Observed/Asst*	*Yes*	*Not Observed/ Asst*	*Pt*
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						