AN EVIDENCED BASED REVISION OF AN ORAL CARE PROTOCOL TO REDUCE VENTILATOR ASSOCIATED PNEUMONIA IN CRITICAL CARE

The Miriam Hospital
A Lifespan Partner

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ABSTRACT

Ventilator associated pneumonia (VAP), defined as pneumonia that develops in an intubated patient, represents the most common nosocomial infection in that population. Research has demonstrated that the oral cavity can become colonized with pathogens within 24 hours of intubation, and preventive strategies have been identified, including use of chlorhexidine (CHX).

The *purpose* of this study was to examine the impact of .12% CHX on VAP rates in critical care patients. The Lifespan IRB approved this research protocol.

A pre-post *design* was used.

The *sample* included all patients admitted to any of the critical care units and on mechanical ventilation at any time during the hospital stay.

The *setting* was a 247 bed tertiary academic medical center.

Data collection occurred over a 24-month period. Twelve months of baseline data was examined prior to the introduction of the enhanced oral care protocol with CHX. Twelve months of data were collected post implementation of the CHX oral care protocol.

Nursing and respiratory therapy staff participated in a training session provided by the critical care educator before the revised protocol was introduced. The protocol was delivered every six hours and included assessment of the oral cavity, tooth brushing, application of CHX with a foam swab to teeth, oral cavity, and tongue in a circular fashion over 30 seconds, and subglottic suctioning. Periodic audits were conducted to assure compliance with the protocol.

Results include examining differences in pre and post intervention VAP rates for the critical care units. Average monthly VAP rate/1000 vent days was reduced from 5.95 to 2.07.

Conclusions and implications for nursing practice include : A Q 6 hour oral care protocol including tooth brushing and use of .12% CHX rinse resulted in a reduction in VAP cases in the 6 month period following the intervention. For every VAP avoided, the institution will save an estimated $40-57,000.

BACKGROUND

Ventilator associated pneumonia (VAP) is a serious, nosocomial threat to critically ill mechanically ventilated patients and is a major cause of morbidity, mortality, and health care expenditures. Currently, evidenced based guidelines, including those available from IHI, the CDC (Talban,2004), and the American Association of Critical Care Nurses (2006) fail to recommend the use of CHX in critical care patients other than those under going cardiac surgery. Consistent with these recommendations, in 2005, the Evidenced Based Practice and Research Council at The Miriam Hospital recommended for critical care patients:

- Oral care with cleansing and suctioning every four hours
- Tooth brushing every 12 hours (with chlorhexidine in cardiac surgery patients only)

In reviewing current practice some questions arose :

- Are we negating the potential benefit of CHX by cleaning the oral cavity between applications ?
- Should CHX be applied more frequently?
- Would CHX be effective in the general Critical Care population?

Current literature review revealed:

- CHX has a broad range of activity, acts rapidly for 6 hours
- Effective against gram positive organisms
- Several recent meta-analyses (Chan, Ruest, O Meade, & Cook, 2007; Pineda, Saliba, & Dolh, 2006; Tantipong, Morkchareonpong, Jaiyindee, & Thamlikitkul, 2008) showed some positive effect in reducing VAP in mixed ICU patients .

An audit of oral care practices demonstrated inconsistent subglottic suctioning however overall compliance was evident.

METHODS

PURPOSE

The purpose of this study was to examine the impact of .12% CHX rinses as one component of a comprehensive oral care protocol for all critical care patients.

SAMPLE

The sample included all patients admitted to any of the three critical care units at TMH and on mechanical ventilation at any time during that stay within the twelve month study period.

DESIGN

The study employed a quasi-experimental pre post design.

PROCEDURES

Twelve months of retrospective baseline data was collected to determine incidence rates of VAP prior to the study.

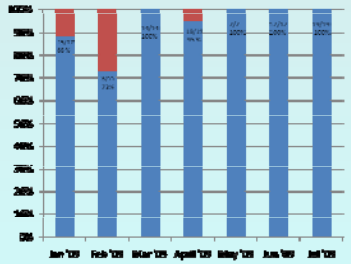
The intervention was a revision to the oral care protocol utilized in the critical care units.

- .12% CHX was used as a cleansing agent for all critical care mechanically ventilated patients.
- Changing oral care to Q6 hours including oral assessment, tooth brushing, application of CHX with a foam swab to teeth, oral cavity, and tongue and subglottic suctioning.
- Prior to the intervention, all nursing staff and respiratory therapists participated in an education session that included the details of the changes to the protocol as well as the supporting evidence.
- Post intervention data collection included random audits of documentation to assure compliance with the protocol, use of oral care products, verification of CHX administration, and VAP rates continued to be monitored for twelve months.

SURVEILLANCE DEFINITION OF VAP

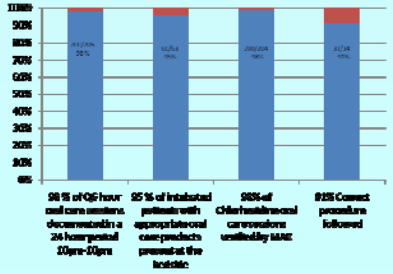
- Follow National Healthcare Safety Network (NHSN) definition for VAP
- Pneumonia is identified by using a combination of radiologic, clinical and laboratory criteria
- Pneumonia is reported as a VAP when the patient is intubated and ventilated at the time of or within 48 hours before the onset of the event
- There is no minimum period of time that the ventilator must be in place in order for the pneumonia to be considered ventilator-associated

PRE INTERVENTION ORAL CARE DATA

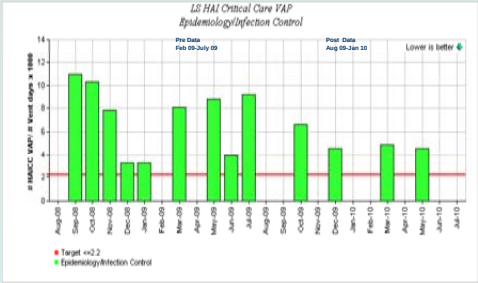


% of Q4 hour oral care episodes documented on flow sheet
(Total intubated patients = 99)

POST INTERVENTION ORAL CARE DATA



VAP RATES PRE & POST INTERVENTION



STAFF COMMENTS

"It is so much easier now that we always do oral care the same way at all times and on all units."

"The products are convenient but a 24 hour pre-packaged kit would be even more convenient." "A lip moisturizer should be included in the package not ordered separately."

"The subglottic suction catheter reduces secretions."

"The patients mouths seem to be less dry and in better condition, cleaner."

CONCLUSIONS

- A Q 6 hour oral care protocol including tooth brushing and use of .12% CHX rinse resulted in a reduction VAP cases in the month period following the intervention. Average monthly Vap rate/1000 vent days was reduced from 5.95 to 2.07. This translates to a 65% reduction in VAP rate after intervention.
- Improved compliance with procedure including sub-glottic suctioning may have contributed to the reduction in VAP rates.

NEXT STEPS

- Oral care monitoring will continue as part of oral care auditing.
- VAP rates will continue to be monitored as part of quality improvement.
- New products will continue to be investigated including possible 24 hour packaging of products by company and new endotracheal tubes.
- VAP education will be reinforced annually.
- Feedback to staff on compliance with oral care and VAP rates will continue.
- RCA completed on all VAP cases.
- New evidence will continue to be incorporated into our oral care protocol