

Oral care strategies in patients in intensive care units

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ABSTRACT

Oral care is a fundamental aspect of nursing and impacts the health, comfort, and well-being of patients over both the short and long term. Providing adequate oral care for patients in intensive care units (ICUs) is particularly challenging, due in part to problems of caring for very sick patients in a busy stressful environment, which may result in oral care having a lower priority for nurses than other aspects of care. This review considers the evidence supporting the use of oral care in ICU patients and makes recommendations for comprehensive care.

Keywords: Oral health; dental care; MICU dental care

INTRODUCTION

Maintaining a healthy upper airway in an ICU patient can be problematic due to the presenting condition of the patient and the medical treatment provided. Since many ICU patients are immunocompromised, they have a predisposition to oral infections, such as candidiasis or herpes simplex,¹ and some medical conditions, e.g., chronic anaemia, diabetes, Crohn's disease, and leukaemia, have oral manifestations. The medical treatment provided in an ICU may also create oral complications. Oral intubation leads to xerostomia, mucositis, and a shift in the bacterial flora from predominantly Gram-positive bacteria to Gram-negative bacteria.² The use of endotracheal tubes and tape, mouth props, and suctioning devices all increase the risk of oral trauma in ventilated patients. The endotracheal tube can obscure the view of the oral cavity and limit access for oral care.³

Drugs may have unwanted side effects; for example, some antihypertensive, sympathomimetic, and anticholinergic drugs can cause xerostomia, and antibiotics can lead to colonization of the oral cavity with opportunistic pathogens, such as *Candida albicans*.⁴ The practice

of therapeutic dehydration used to improve respiratory, renal, and cardiac function can also exacerbate xerostomia.⁵ Inadequate oral care may predispose ICU patients to infections. Ventilator-associated pneumonia (VAP), for example, is a life-threatening nosocomial infection and is associated with aspiration of bacteria from the oropharynx and leakage of contaminated secretions around the endotracheal tube.⁶ The bacteria responsible for VAP colonize the oral mucosa and the dental plaques of intubated patients.⁷ Thus, providing adequate oral hygiene is an important aspect of care.

Ventilator-associated pneumonia is a potentially preventable consequence of intubation and mechanical ventilation and is the most common nosocomial infection in mechanically ventilated patients.⁸ Critically ill patients who are intubated for more than 24 hours are at higher risk for VAP, and, therefore, mouth care and oral health should be an important part of nursing care. The current literature has identified problems with adequate oral care in intubated patients that include the definition and quantification of oral care.⁹ The Centers for Disease Control and Prevention guidelines maintain that the primary route of bacterial entry into the lungs is through the oropharynx during episodes of micro-aspiration.¹⁰

Oral care is an intervention that can be performed by the nursing staff during their patient care routines to decrease VAP incidence rates and therefore should be incorporated into the plan of care for intubated

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patients.¹¹ Although there are other methods involved in VAP prevention, adequate oral hygiene alone has substantial benefit due to the excess salivary retention as a result of impaired swallowing and bacterial growth in intubated patients. "Stagnation of saliva promotes proliferation of bacteria. If overgrowth of bacteria occurs in the oral cavity, then an immune response is initiated and the individual becomes infected."¹² Understanding of the underlying pathophysiology of VAP is important for nurses to effectively implement preventative care measures.¹²

ORAL CARE PROTOCOL IMPLEMENTATION

Although the intended outcome may be the same, individual nurses often have their approaches to providing patient care. The best interest of the patient is always the top priority; however, patient care routines may vary depending on the nurse's educational and career backgrounds and beliefs about nursing care. Therefore, specific oral care guidelines for VAP prevention for intubated patients in the ICU should be implemented for nurses. This would reduce misunderstandings about the expected oral care practices needed in these patients.

Garcia et al. found that by implementing a comprehensive oral-dental care protocol, the incidence of VAP may drastically decrease.¹³ Adult patients who had been intubated for more than 48 hours were studied at a large teaching hospital in the 10-bed medical intensive care unit over a 48-month period. Flow sheets were used to review nursing compliance with the established oral care protocol. The protocol consisted of specific interventions for nurses while caring for intubated patients, including daily oral assessment, deep suctioning, tooth brushing, and oral cleansing of the lips and tissues. This study reported a significant decrease in ventilator days resulting from increased nursing compliance to the comprehensive oral-dental care protocol. The results showed a VAP rate of 12 per 1000 ventilator days before the introduction of this protocol and a VAP rate 8 per 1000 ventilator days after the introduction of a comprehensive oral-dental care protocol. This study concluded that adding oral care protocols to VAP prevention guidelines can reduce VAP in the ICU.¹³

In another study, nursing adherence to oral care guidelines was an essential factor in VAP prevention.¹⁴

This study focused on how putting institutional oral hygiene protocols into effect influences the oral care provided by nurses in the ICU. "Despite strong evidence in the literature on the role of oral care in prevention of VAP, nurses continue to view it as a comfort measure with low priority."¹² Providing nurses with more reliable information that demonstrates the effectiveness of oral care practices could reduce some of the reported reasons for noncompliance and increase the priority of oral care. If evidence-based practice is observed more frequently, there could be an increase in nursing adherence to oral care recommendations. The study determined that noncompliance to oral care guidelines decreases when there are set guidelines in place at hospitals.¹⁴

Oral care interventions that are proven beneficial by evidenced based practice must be understood by the nursing staff to increase compliance. When creating a VAP bundle intended to decrease incidences of VAP among ICU patients, Sedwick et al. discovered that application of oral chlorhexidine, an oral antiseptic, had a strong effect on reducing VAP rates, whereas the use of oral antibiotics did not have the same effect. This study also found that patients with more dental plaque were at higher risk for developing VAP.¹⁵

The Essence of Care document, published by the Chief Nursing Officer,¹⁶ emphasizes the need for individualised oral needs assessment and oral care planning and the importance of reassessment and modification of oral care as appropriate. Various assessment tools are available, including ones described by Jenkins,¹⁷ Barnason et al.,¹⁸ or Fitch et al.¹⁹ However, McNeill suggests that assessment tools are not often used in practice, possibly because of a lack of time or knowledge, or because they do not assist nurses in diagnosing particular oral problems. While it is important to provide an oral care plan appropriate to an individual patient's needs, there are some oral hygiene practices that should be provided for all intubated patients to keep the oral cavity moist and clean and to reduce nosocomial infections. These practices involve regular moisturising of the oral cavity with water or moisturising gels, regular lubrication of the lips with a lip balm, and regular use of a toothbrush to clean the oral cavity (British Society of Disability and Oral Health [BSDH]).^{3,20} Studies examining oral care methods of ICU nurses have found that many nurses do not use evidence based oral care methods. For instance, it has been shown that many nurses are reluctant to use

toothbrushes for cleaning the oral cavity of an intubated patient and prefer foamsticks.²¹ Foamsticks do not effectively remove plaques but are useful for moisturising the oral cavity between brushings.²² A small headed soft toothbrush is the most effective plaque removal tool, and even edentulous intubated patients should have their oral mucosa and tongue gently brushed to help maintain a healthy oral environment.²³

Several studies^{24,25} have demonstrated that removing bacteria from the oropharynx requires the removal of dental plaques, and that the only way to remove plaques is with a toothbrush. Pearson and Hutton²⁶ and others found that the majority of nurses use a soft Toothette[®] instead of a toothbrush and that the Toothettes do not remove plaque as effectively as toothbrushes. Consequently, oral bacteria can proliferate.²⁷

RECOMMENDATIONS

Pearson and Hutton²⁶ completed a controlled trial that compared the ability of foam swabs and toothbrushes to remove dental plaque and measured the differences. They concluded that use of a toothbrush must be taught to nurses and clinical support staff. Schleder reviewed the pathogenesis of bacterial infections, identified risk factors, including colonization of the oropharynx, and recommended the following approaches.²⁸

1. Use good oral hygiene, including toothbrushing, with all patients.
2. Implement oral hygiene assessments and intervention strategies for all patients at risk for developing VAP.
3. Decontaminate devices that come into contact with the respiratory tract.
4. Implement the hand hygiene guidelines released by the CDC in 2003. The guidelines include decontaminating hands by washing them with antimicrobial soap and water or by using an alcohol-based, waterless antiseptic agent if hands are not visibly contaminated. In addition, gloves should be worn when handling respiratory secretions or objects contaminated with the respiratory secretions of any patient.

Several studies have shown that the use of a toothbrush and oral care, along with concurrent

nursing interventions, such as increasing the patient's mobility, elevating the patient's head, consistently washing one's hands, and performing universal gloving, can reduce and prevent the occurrence of VAP. Bacteria reside in plaque in the oropharynx and are transmitted to the lungs via micro aspiration.^{29,30} The use of chlorhexidine products for oral care in ventilated patients significantly reduces the incidence of nosocomial respiratory infections.^{31,32}

Kiyoshi and Blegen investigated nursing compliance in practices that adhere to the recommendations of the American Association of Critical-Care Nurses (AACN) regarding proper oral care practices, which are as follows: "(1) brush teeth, gums and tongue at least twice a day using a soft pediatric or adult toothbrush; (2) provide oral moisture to oral mucosa and lips every 2 to 4 hours; and (3) use an oral chlorhexidine gluconate (0.12%) rinse twice a day during the perioperative period for adult patients who undergo cardiac surgery." Taking the AACN's recommendations under consideration, the authors created a model of interventions that should be followed for patients undergoing mechanical ventilation in order to prevent VAP. These recommendations include an oral cavity assessment, use of an oral swab to swab the oral cavity, tooth brushing, suctioning, oral rinsing and providing moisture to the oral mucosa.³³

Feidir used the AACN's recommendations as a model to compare with the oral hygiene interventions that used in practice for intubated patients in the ICU. The study concluded that the most common policies for patients receiving mechanical ventilation advise the following interventions: using a toothbrush every 12 hours with toothpaste, swabbing the oral cavity with a foam swab every 2 to 4 hours, using toothpaste with a swab every 4 to 12 hours, suctioning the oral cavity every 2 hours, and assessment of the oral cavity every 4 hours. While the AACN has provided recommendations for oral care, these recommendations are not specifically for intubated patients. Therefore, further interventions should be investigated to increase the effectiveness of VAP prevention. "Oral hygiene is a nursing intervention that may decrease VAP incidence rates."³⁴

Table 1 below summarizes recommended oral care interventions for ventilated patients in the medical intensive care unit.

Table 1. Recommended Oral Care Interventions for Ventilated Patients³⁵

Intervention	Rationale
<ol style="list-style-type: none"> 1. Conduct an initial admission and a daily assessment of the lips, oral tissue, tongue, teeth, and saliva of each patient on a mechanical ventilator. 2. Unit specific protocols should be implemented that assist patients at risk of developing VAP in maintaining saliva production and oral tissue health and minimizing the development of mucositis. 3. Keep the head of the bed elevated at least 30 degrees (unless medically contraindicated) and position patient so that oral secretions pool into buccal pocket, especially important during such activities as feeding and brushing teeth. 4. Patient's oral and subglottic secretions should be suctioned continuously or intermittently/routinely with the frequency dependent upon secretion production. 	<p>Assessment allows for initial and early identification of oral hygiene problems and for continued observation of oral health.</p> <p>Saliva provides both mechanical and immunological effects which act to remove pathogens colonizing the oropharynx.</p> <p>Elevation aids in preventing reflux and aspiration of gastric contents; oral secretions may drain into subglottic area where they become rapidly colonized with pathogenic bacteria.</p> <p>Minimize aspiration of contaminated secretion into lung.</p>

CONCLUSIONS

Ventilator-associated pneumonia is a serious condition that increases mortality and morbidity, but it is also preventable. Critical care nurses are the direct caregivers for patients in the ICU, and it is important for nurses to be made aware of the benefits of complying with adequate oral care practices to decrease the incidence of VAP.

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