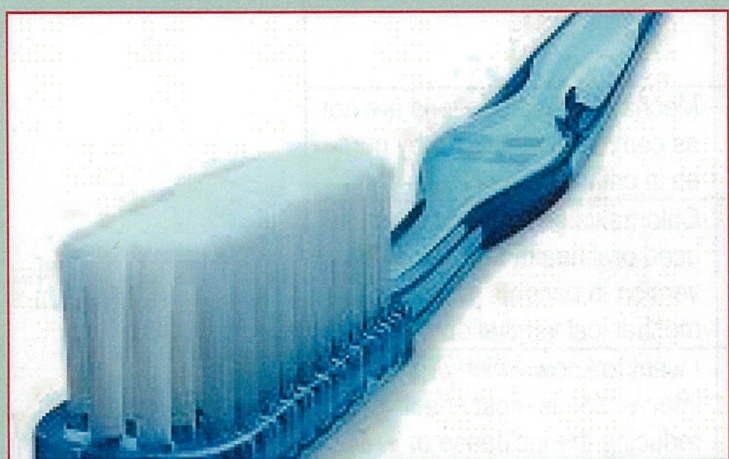


## PREVENT VENTILATOR-ASSOCIATED PNEUMONIA

In the intensive care unit what oral care nursing interventions are the most effective in reducing the development of VAP (ventilator-associated pneumonia) in incubated adults receiving mechanical ventilation for longer than 48 hours; mechanical (tooth brushing) or pharmacological (chlorhexidine)?

By Rose Videler

**Clinical issue:** VAP is the leading cause of death among hospital-acquired infections and is defined as pneumonia that occurs in patients 48-72 hours following endotracheal incubation and receiving mechanical ventilation (Khezri, et al., 2014). Colonization of dental plaque has been proven to be one of the biggest risk factors for the development of VAP as it provides an environment for pathogens thought to be responsible for VAP.



### TOOTHBRUSHING

Research shows that tooth brushing is an effective mechanism for removing plaque however research conducted by Munro and colleagues (2009) did not find it reduced VAP rates in their study comparing its effectiveness against chlorhexidine. However Yao, et al (2011) found it significantly reduced the rates of VAP in their intervention group when used with purified water.

### CHLORHEXIDINE

Chlorhexidine is a strong antiseptic mouth wash however its efficacy in removing dental plaque is questionable (Jones, Munro & Grap, 2012). Despite this, a study conducted by Fourrier and colleagues (2005) found chlorhexidine reduced positive dental plaque cultures in the intervention group but alone did not reduce the incidence of VAP. Munro and colleagues (2009) implemented a study to examine the effects of tooth brushing, use of chlorhexidine and both tooth brushing and chlorhexidine on the incidence of VAP and found that on day three of the study, chlorhexidine oral swabs significantly decreased the incidence of VAP.

**Implications to practice:** The literature presents conflicting results on which intervention is more effective therefore, with no strong evidence-based research to guide practice, nurses through no fault of their own could be providing inadequate oral care to incubated patients receiving mechanical ventilation. It is important that nurses understand the relationship between accumulation of plaque and ventilator-associated pneumonia as removal of dental plaque must be an essential goal of oral care.

**Conclusion:** Further research needs to be conducted to ascertain what the best oral care interventions are for mechanically ventilated patients so that standardised protocols can be developed and integrated into practice. Until then, a combination of both chlorhexidine and tooth brushing could be beneficial.

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## PECOT MODEL

Population	Incubated adults in intensive care units receiving mechanical ventilation	I want to assess the oral health care interventions in those patients incubated and receiving mechanical ventilation only as these patients are at higher risk of nosocomial pneumonia
Exposure	Adults receiving mechanical oral health intervention; tooth brushing	Mechanical interventions are not as commonly practiced by nurses in critical care settings
Comparison	Adults receiving pharmacological intervention; Chlorhexidine	Chlorhexidine is the most widely used oral health nursing intervention in patients receiving mechanical ventilation
Outcome	There will be a difference in the occurrence of VAP in ventilated patients receiving either mechanical or pharmacological interventions	I want to know which oral health intervention is most effective in reducing the incidence of VAP
Time	48hours – 7 days	Within 48hours of admission to the intensive care unit oral flora of critically ill patients undergoes a change from gram-positive bacteria to gram-negative bacteria thought to be responsible for VAP. Furthermore, we want to examine if there is a reduction of VAP within the first week of incubation in adults receiving mechanical ventilation

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