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British Association of Critical Care Nurses: Evidence-based consensus paper for oral care within adult critical care units

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Abstract

Background: Patients who are critically ill are at increased risk of hospital acquired pneumonia and ventilator associated pneumonia. Effective evidence based oral care may reduce the incidence of such iatrogenic infection.

Aim: To provide an evidence-based British Association of Critical Care Nurses endorsed consensus paper for best practice relating to implementing oral care, with the intention of promoting patient comfort and reducing hospital acquired pneumonia and ventilator associated pneumonia in critically ill patients.

Design: A nominal group technique was adopted. A consensus committee of adult critical care nursing experts from the United Kingdom met in 2018 to evaluate and review the literature relating to oral care, its application in reducing pneumonia in critically ill adults and to make recommendations for practice. An elected national board member for the British Association of Critical Care Nurses chaired the round table discussion.

Methods: The committee focused on 5 aspects of oral care practice relating to critically ill adult patients. The evidence was evaluated for each practice within the context of reducing pneumonia in the mechanically ventilated patient or pneumonia in the non-ventilated patient. The five practices included the frequency for oral care; tools for oral care; oral care technique; solutions used and oral care in the non-ventilated patient who is critically ill and is at risk of aspiration. The group searched the best available

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evidence and evaluated this using the Grading of Recommendations Assessment, Development, and Evaluation system to assess the quality of evidence from high to very low, and to formulate recommendations as strong, moderate, weak, or best practice consensus statement when applicable.

Results: The consensus group generated recommendations, delineating an approach to best practice for oral care in critically ill adult patients. Recommendations included guidance for frequency and procedure for oral assessment, toothbrushing, and moisturising the mouth. Evidence on the use of chlorhexidine is not consistent and caution is advised with its routine use.

Conclusion: Oral care is an important part of the care of critically ill patients, both ventilated and non-ventilated. An effective oral care programme reduces the incidence of pneumonia and promotes patient comfort.

Relevance to Clinical practice: Effective oral care is integral to safe patient care in critical care.

KEYWORDS
consensus statement, hospital acquired pneumonia, oral assessment, oral hygiene, ventilator-associated pneumonia

1 | INTRODUCTION

Critically ill patients who are unconscious or sedated in critical care units often need to receive mechanical ventilation which exposes them to the risk of developing Ventilator Associated Pneumonia (VAP). The definition for VAP is a new onset pneumonia that has developed in patients who have been mechanically ventilated for more than 48 hours via an endotracheal (ET) tube or tracheostomy tube.[1-3] Hospital acquired pneumonia (HAP) is an acute lower respiratory tract infection which is acquired at least 48 hours after hospital admission and was not developing at the time of hospital admission, but in patients who are not mechanically ventilated and often present to hospital with another underlying condition.[4,5] VAP and HAP significantly increase mortality and complications, resulting in increased duration of ventilation, longer intensive care unit (ICU) stay by up to 6 days, increased hospital length of stay, and increased hospital costs by £6000-22 000 per VAP episode.[6-8] Evidence suggests that approximately 10%-28% of ventilated patients acquire VAP, making it the most common, serious nosocomial infection in critical care patients.[9,10] The diagnosis of VAP is complex because there is no consensus on its diagnostic criteria.[2,7,11] For the purpose of this consensus paper, it was acknowledged that there are differences in VAP diagnosis definitions in the literature, but a specified VAP diagnosis definition was not considered essential for the generation of this consensus document.

Some reviews have demonstrated that implementing evidence-based interventions, such as elevating the head of the bed, implementing daily sedation holds, and effective oral hygiene, may prevent VAP.[12] The National Institute for Health and Care Excellence, the National Patient Safety Agency, and the United Kingdom Department of Health released guidance on high impact interventions with the aim of reducing the incidence of VAP in the UK critical care units.[2] The findings from the studies on interventions have also led to the widespread adoption of the Ventilator Care Bundle. A care bundle is defined as a group of evidence-based practices, which encourage consistent care delivery to improve clinical outcomes.[12] This consensus document will focus specifically on oral care interventions within the VAP care bundle. The aim is to provide an evidence-based endorsed consensus paper for best practice relating to implementing oral care, with the intention of promoting patient comfort and reducing hospital acquired pneumonia and ventilator associated pneumonia in critically ill patients.

2 | DESIGN

A nominal group technique (NGT) was adopted for developing this consensus paper. The NGT is used as a reliable data collection and synthesis method where group consensus is required.[13] NGT enables the views of multiple experts and stakeholders on any given topic to be obtained and a group consensus achieved through structured face-to-face focus group meetings. The advantage of the NGT is that it facilitates diverse opinions and experiences to be expressed and collated with the intention of establishing areas of consensus.[14] Harvey and Holmes highlight that the collaborative nature of the NGT increases the stakeholders' ownership of the ensuing research and therefore increases the likelihood of changing clinical practice and policy.[14]

3 | METHOD

A consensus committee of critical care nurse experts from around the United Kingdom held a meeting to evaluate the existing oral care practices and to review the associated evidence and its application in

reducing the incidence of VAP/HAP. The round table discussion was chaired by an elected national board member for the BACCN who has experience in generating national guidelines and consensus documents. Follow up meetings were conducted using online platforms.

Relevant evidence was identified by searching PubMed (including Medical Subject Headings), the Cumulative Index of Nursing and Allied Health Literature (CINAHL) (including *CINAHL* Subject Headings), and Web of Science databases utilising the search terms "oral care" OR "oral hygiene" OR "mouth care" AND "critical care" OR "intensive care" OR "high dependency" AND "ventilator associated pneumonia" OR "hospital acquired pneumonia" OR "pneumonia" OR "chest infections." Primary and secondary research articles published in English prior to December 2018, were selected predominantly based on their relevance to oral care practices in adult critical care settings.

After reviewing the identified evidence and reflecting on clinical practice, the committee shared their ideas and thoughts in a round table discussion. The committee identified and prioritized 5 aspects of oral care practice relating to the Level 2 (High Dependency Units) and Level 3 (ICU) critically ill patient: frequency for oral care; tools for oral care; oral care technique; solutions used and oral care in the non-ventilated patient who is critically ill and is at risk of aspiration. The committee then evaluated the evidence using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system[15] (Table 1) to assess the quality of evidence from high to very low, and to formulate recommendations as strong, moderate, weak, (Table 2) or best practice consensus statement when applicable. Each committee member had the opportunity to present their individual evaluations which were then discussed and clarified until a consensus was reached. A draft consensus statement was developed and circulated to each committee member for comment. A final consensus statement was agreed upon by all committee members after several rounds of comments and discussion which took place over 12 months. See Appendix 1 for the papers included within the review process.

TABLE 1 Determination and hierarchy of quality of evidence

Grade	Research methodology
1. High quality evidence	Systematic Reviews with meta-analysis, Randomized Controlled Trial
2. Moderate quality evidence	Downgraded RCT or upgraded observation studies
3. Low quality evidence	Good quality observational studies with randomization
4. Very low quality evidence	Downgraded controlled studies or expert opinion

Factors that may decrease strength of evidence from GRADE criteria

1. Methodology issues of RCTs that suggest high likelihood of bias
2. Inconsistency of results, including problems with subgroup analysis
3. Indirectness and variability of evidence (eg, variation in population, intervention, control, outcomes, comparisons, sample size)
4. Imprecision of results, data and subsequent conclusions
5. High likelihood of reporting bias

Note: References 15,16.

4 | FINDINGS

4.1 | Assessment and frequency of oral care

Consensus statement regarding oral care assessment in the ventilated patient:

1. In a mechanically ventilated patient, an oral care assessment should be completed within 6 hours of admission (Strong, 4). All critically ill patients should be assessed using a standardized oral care assessment tool (see discussion below regarding assessment tools) and the results of the assessment should be documented. Assessment every 12 hours is encouraged (Strong, 4).
2. Non-ventilated patients should have an oral assessment completed within 6 hours of admission (Strong, 4). The tools suggested for ventilated patients are also appropriate for non-ventilated patients (Strong, 4).
3. The consensus group agreed that numerous oral assessment tools exist, most of which have not been validated. While the group agreed they could not endorse a specific assessment tool, there was agreement that it is imperative to have and use an assessment tool (Moderate, 4).
4. The chosen oral assessment tool should be locally ratified, and all critical care staff should be trained in its use. There should be a standardized training and assessment across all staff on the designated oral assessment tool, to ensure familiarity with the tool (Moderate, 4). Examples of acceptable oral care assessment tools include Mouth Care Matters from National Health Service Health Education England,[17] the Beck oral care assessment tool,[18] the assessment tools noted in the Registered Nurses' Association of Ontario's Nursing Best Practices Guideline,[19] the Ministry of Health Nursing Clinical Practice Guidelines[20]and the Bedside Oral Exam.[21] The Beck guidelines suggest assessment of ventilated patients every 4 hours, but assessment can be performed more frequently, if needed.

4.1.1 | Discussion

Oral assessments on either ventilated or non-ventilated patients should include assessing the oral cavity, including the tongue, lips, teeth, gums, saliva, hard palate, soft tissues, and dentures.[21-23] An oral assessment should be performed frequently as part of a systematic patient assessment and should be used to identify those at increased risk of oral complications.[19] However, there is wide variability in assessment and oral care assessment tools between institutions as well as within institutions,[24,25] and inconsistent performance and documentation of oral assessment and care.[26,27] In an attempt to address standardisation, NHS HEE launched its Mouth Care Matters assessment and recording tool which aims to promote the implementation of a standardized oral care programme into hospitals within the NHS.[17] There are several other recommended assessment tools that are available for use for assessing oral care.[18,20-22] The Beck

TABLE 2 Factors determining strong vs weak recommendation

Grading of recommendations	Descriptor
Strong	Implementing the intervention in practice is strongly recommended
Moderate	Implementing the intervention in practice is recommended
Weak	Implementing the intervention in practice should be considered
What should be considered?	**Recommended process**
Is there high or moderate quality evidence?	The higher quality the evidence and publications, the higher the likelihood of a "strong recommendation" for the best practice statement
Is there certainty about the balance of benefits vs harm/burdens?	The larger the difference between the desirable and undesirable consequences and the certainty around that difference, the more likely a strong recommendation. The smaller the net benefit and the lower the certainty for that benefit, the more likely a weak recommendation.
Is there certainty or similarity?	The more certainty or similarity in values and preferences, the more likely a strong recommendation.
Are resources worth the expected benefits?	The lower the cost of an intervention compared with the alternative and other costs related to the decision (ie, fewer resources consumed, staff manpower), the more likely a strong recommendation.

Note: References 15,16.

assessment tool provides a comprehensive system that includes measures on a numerical scale.[18] Whilst there is limited research on the validity of these tools, they provide a comprehensive assessment tool that has been endorsed by the NHS. Although the focus on the mechanically ventilated patient is limited, the assessment tool does provide a thorough holistic resource for health care professionals.[17]

4.2 | Toothbrushing

Consensus statement regarding tooth brushing:

1. The teeth of ventilated patients should be brushed twice daily, for a minimum of 2 minutes. In addition, oral cleansing with swabs, suctioning, and moisturisation of the mouth should be done every 2 to 4 hours (Strong, 1).
2. Non-ventilated patients should have the same oral care completed as above, with accommodation in the schedule as needed to accommodate the patient's condition, preferences (consent), and sleep patterns (Strong, 1). (See Table 3 for detailed oral care equipment, and procedure including rationale).

4.2.1 | Discussion

Numerous protocols for oral care include toothbrushing, with recommendations that the teeth of ventilated patients should be brushed twice daily, for at least 2 minutes.[28-36] Oral cleansing with swabs, suctioning, and moisturisation of the mouth should be done more frequently, with recommendations suggesting cleansing every 2 to 4 hours.[34-41]

4.3 | Oral care techniques and equipment

Consensus statements regarding oral care technique and equipment:

1. The teeth should be brushed with a paediatric or soft small headed toothbrush to remove plaque. Use suction to remove the secretions and debris after brushing. If available, a suction toothbrush may be ideal to help remove secretions and debris at the same time the teeth are brushed. Consider using a single-use disposable toothbrush (Strong, 1).
2. A swab is recommended for cleaning and moisturising the oral cavity and teeth between brushings. If available, a suction swab offers the advantage of concurrent suction to remove secretions and debris (Strong, 3).
3. Oral foam head swabs can be used for cleaning and moisturising, but they must be used as per manufacturers' recommendations. Foam swabs should not be stored in liquid as this will affect the strength of the attachment of the foam to the stick, increasing the likelihood of the foam detaching and creating a possible choking hazard. Each foam head swab should be moistened immediately before use and the attachment of the foam head to the stick checked before use (Strong, 4).
4. After cleaning, moisturize the oral mucosa throughout the oral cavity and the lips with artificial saliva/lubricant (Weak, 4)
5. Consider using oral care tools and supplies that can be kept at the bedside, to enhance workflow and support compliance with the oral care protocol (Moderate, 4)

See Table 3 for detailed oral care equipment, and procedure including rationale.

4.3.1 | Discussion

Dental plaque has been shown to serve as a reservoir for respiratory pathogens,[42] suggesting that improving oral care may reduce the risk of VAP development by reducing the amount of plaque present.[43-45] Many studies have suggested benefits from toothbrushing as part of

TABLE 3 Procedure for oral care

Equipment	• Paediatric soft, small headed toothbrush • Mouth swabs/foam stick • Fluoride/non-foaming toothpaste • Sterile water • Low volume syringe • Soft suction catheter • Rigid oropharyngeal suction catheter • Lubricant • If available, proprietary mouth care kit • If available, suction small headed toothbrush
Procedure	**Rationale**
All critically ill patients should be assessed using a standardised oral care assessment tool used in the critical care unit within 6 h of admission. This should be documented accordingly.	This will ensure consistency between staff and will assist with a comprehensive oral examination. This will provide care planning and may reduce the incidence of nosocomial pneumonia.
A formal oral care assessment should occur at least every 12 h and documented accordingly.	Provides reassessment of oral cavity and provides consistency between staff.
Prepare all the necessary equipment.	To ensure all the equipment for the procedure is available.
Ensure sufficient light is available.	This will ensure suitable visualisation of the oral cavity.
Where possible, explain the procedure to the patient and/or the family member. If the patient lacks capacity to make decisions such as sedated and ventilated, then the practitioner must act in the patient's best interests for providing oral care.	This will ensure the patient and their relatives understand the procedure and its significance to care management and valid consent is obtained. Abiding to the patient's best interests are maintained as per the Mental Capacity Act 2005.
Apply appropriate personal protective equipment (PPE) as per local policy and undertake hand hygiene.	Protect both clinician and patient from potential infection and spread of micro-organisms.
If not contraindicated, sit patient up and support their head with pillows.	This will help with fluid removal and reduce the accumulation of fluid in the oropharyngeal region.
Brush teeth with a small headed soft bristled toothbrush with fluoride/non-foaming toothpaste and sterile water.	The paediatric or small headed toothbrush will facilitate easier movement around oral cavity and ET tube. Toothpaste will help reduce the incidence of plaque formation.
Brush teeth a minimum of twice a day for at least 2 min. Consider patients sleep patterns and patient preferences if patient is conscious and able to communicate.	Physical brushing of the teeth will remove plaque and bacteria which may reduce VAP. Cleaning the teeth aids patient comfort.
Brush teeth away from the gums.	This will reduce incidence of plaque accumulating into the gum crevices.
If tongue is heavily coated, gently brush with toothbrush.	This will assist with the removal of biofilm that maybe coated on the tongue and increase patient comfort.
Rinse oral cavity with sterile water after teeth brushing. Use a low volume syringe (eg, 5 mL) to remove any toothpaste and debris from the mouth. Use suction to remove secretions and debris after brushing.	This will remove toothpaste and debris from the mouth and reduce aspiration of accumulating fluid. Minimise the volume of water to reduce the volume of potentially aspirated material.
Suction and remove any fluid or secretions in the trachea using a soft suctioning catheter. A suction toothbrush and suction swab could also be used to assist with oral care fluid removal.	This will reduce aspiration of fluid and microorganisms which may increase the incidence of VAP.
If a patient has bleeding gums, assess patient for coagulopathy or low platelet count. Unless contraindicated, continue to brush bleeding gums as this is often gingivitis and gum brushing is required.	The leading cause of gum bleeding is gingivitis. Dental plaque irritates the gum causing gingivitis, so rigorous brushing of bleeding gums removes the plaque and resolves the bleeding gingivitis. With coagulopathies, liver failure or low platelet count over rigorous teeth brushing may create bleeding gums.
An oral foam stick can be used to clean and moisturise the oral cavity between teeth brushing. This is recommended every 2 to 4 h. Moisten foam stick with sterile water immediately before use and dispose of foam stick after single use.	This will moisten the mouth preventing mucosa breakdown. Moistening of the oral cavity promotes patient comfort. Foam sticks soaked in water reduce their strength and the foam may dislodge from the stick and create a choking hazard.
A water-soluble moisturiser maybe used throughout the oral cavity and lips. Moisten lips frequently with lubricant.	This reduces drying of the mucosa and promotes patient comfort.
Consider using oral care tools and supplies that can be kept at the bedside.	This will enhance workflow and compliance to an oral care protocol.
Caution should be given with the routine use of chlorhexidine as part of an oral care programme.	Using an antiseptic oral rinse, such as chlorhexidine or cetylpyridinium chloride, after brushing or in combination with comprehensive oral care

TABLE 3 (Continued)

There may be individual patient clinical situations in which oral chlorhexidine is necessary. This decision should be made in consultation with the multi-professional team in line with local hospital policies which should include the prescribing of chlorhexidine on the prescription chart.	can help reduce the risk of VAP particularly in adult cardiothoracic ICU populations. A meta-analysis suggests that chlorhexidine use may increase mortality risk especially in non-surgery patients.[64] Until further conclusive evidence we advise caution with the routine use of chlorhexidine.
Ensure the ET tube ties are secure, and the ET tube is in the correct position. Assess the skin around under and around the ties and the ET tube to reduce the risk of pressure damage. Avoid pressure on the corners of the mouth as this may cause pressure damage. If possible, change ET tube position on lips at least daily. Change ET tube ties as per local policy.	To ensure that the airway is maintained, that the ET tube remains in situ and that the ties correctly position the ET tube to enable effective airway and ventilatory management. Avoid too much direct pressure of the ET tube and ties which will increase the incidence of pressure damage.
If available aspirate fluid from sub-glottic suction device from ET tube or Tracheostomy as per manufacturer's instructions or apply deep oropharyngeal suction.[74]	Ensure that secretions above the cuff of the tube are removed to reduce micro-aspiration of fluid into lungs.
Clean dentures a minimum of once daily with a toothbrush. Soak dentures daily in a denture cleansing solution Remove dentures overnight	Removes debris and plaque and promotes patient comfort. Provides additional chemical breakdown of plaque and additional disinfection of denture. May reduce the risk of fungal infection and allow the tissues time to heal.
Document oral care and record assessment and any abnormalities. Ensure effective handover of oral care and assessment at shift changes.	Ensure accurate assessment records and documentation is maintained. This provides a point of reference and comparison between handover of care and promotes effective ongoing care management.

the oral care of ventilated patients.[11,29,30,33,43,44] Current literature is conflicting, with some data showing reduction in the risk of VAP with protocols, including tooth cleaning[32] and others showing either equivocal data,[28] or data that suggests no benefit.[46,47]

Studies support the use of a standard paediatric or soft toothbrush to remove plaque, followed by suction to remove the secretions and debris after brushing.[28-30,32-34,41,48,49] Using a suction toothbrush can help remove secretions and debris at the same time the teeth are brushed; minimising the use of water may reduce the volume of aspirated material.[12] A single-use disposable toothbrush may be beneficial, because devices used in the mouth can become colonized with oral pathogens.[50,51] However, their use must be balanced with considerations of available resources.

Swabs are recommended for cleaning and moisturising the oral cavity and teeth between brushings.[34-41] If available, a suction swab offers the advantage of concurrent suction to remove secretions and debris.

Dryness in the oral cavity leading to mucositis is associated with an increase in oropharyngeal colonisation with pathogenic microorganisms.[52] Several study protocols have included the step of moisturisation throughout the oral cavity and the lips with agents such as chlorhexidine, artificial saliva, and other mosturizers.[48,53-55]

In 2012, the Medicines and Healthcare Products Regulatory Agency (MHRA) issued an alert relating to using oral foam head swabs in that they may detach from the stick during use.[55] This may present a choking hazard for patients. MHRA specifically advised that foam head swabs should not be left to soak in liquid prior to use as this may affect the strength of the foam head attachment from the stick and that swabs should be moistened immediately prior to use and should be discarded after each use. Prior to using a foam stick it should be checked that the foam head is firmly attached to the stick and if the patient is likely to bite down a small headed toothbrush with soft bristles could be used instead.[55] Having the oral care supplies at the bedside has been proposed to enhance workflow, in turn supporting compliance with protocols for oral care and assessment.[30,32,39,56]

4.4 | Oral cleansing solution

Consensus statement regarding oral cleansing solution:

1. Using an antiseptic oral rinse, such as chlorhexidine or cetylpyridinium chloride, after brushing or in combination with comprehensive oral care can help reduce the risk of VAP particularly in adult cardiothoracic ICU populations. A meta-analysis suggests that chlorhexidine use may increase mortality risk especially in non-surgery patients (Moderate, 1).
2. Due to meta-analysis evidence, at present we advise caution with the routine use of chlorhexidine as part of an oral care programme. There may be individual patient clinical circumstances where use of oral chlorhexidine is necessary, but this decision should be made in consultation and agreement with the multi-professional team and in line with local hospital policies which should include the prescribing of the chlorhexidine on the prescription chart (Moderate, 1).

4.4.1 | Discussion

A range of oral antiseptics and oral antibiotics have all been proposed as potential methods to reduce nosocomial pneumonia. The use of chlorhexidine has been widely debated and there are conflicting results in the literature. Evidence suggests that the use of an antiseptic oral rinse added after brushing or done in combination with comprehensive oral care may help reduce the risk of VAP.[29,36,47,57] Twice-daily application of chlorhexidine gluconate oral rinse within 2 hours of tooth

brushing was shown to reduce the rate of VAP,[11,36,47,58-61] with the strongest supportive evidence demonstrated in cardiac surgery patients.[11] The Cochrane Review by Hua et al[11] concludes that effective oral hygiene care including chlorhexidine mouthwash or gel reduces the risk of developing VAP in critically ill patients from 24% to 18% (RR 0.75, 95% confidence intervals [CI] 0.62-0.91, P = .004). However, there is no evidence of a significant difference in the outcomes of mortality, duration of mechanical ventilation or duration of ICU stay.[11]

The use of chlorhexidine mouthwash should not be used as the sole intervention or viewed as a silver bullet to reduce the risk of VAP and it should be used in conjunction with providing effective oral hygiene that involves teeth brushing. Secondly, further research found that the use of chlorhexidine for the prevention of VAP was significantly effective in adult populations, specifically in cardiothoracic ICUs, and is unclear in populations within the non-cardiothoracic ICU.[12,61-63] Tran and Butcher[63] suggest that the increased benefit of chlorhexidine to patients in cardiothoracic ICU, may be due to the shorter intubation period of below 24 hours. However, a meta-analysis found the use of chlorhexidine with oral care in a patient population outside of the cardiothoracic ICU may increase mortality risk with an odds ratio of 1.25 (95% CI 1.05-1.50).[64] The reason for the possible increase in mortality is unclear but it has been speculated that this may be due to some patients developing acute respiratory distress syndrome from aspiration of the chlorhexidine solution into the lungs which increases mortality, but this has not been empirically proven.[63,65] In order to reduce the risk, it may be advised to utilize tools that incorporate suction (for example, suction toothbrush and suction swabs) when utilising oral chlorhexidine.

The literature is inconclusive relating to the effectiveness of chlorhexidine strengths, preparation, or frequency of use for the prevention of VAP.[11,63] There is no evidence that chlorhexidine was associated with significant reductions in duration of mechanical ventilation or length of ICU stay.[11,12,61-63] The routine use of chlorhexidine is, therefore, not recommended. Further research maybe necessary to investigate the potential risks and benefits of chlorhexidine including the dose, frequency, and application across the wider ICU population. At present we recommend undertaking effective oral care as detailed in these standards but avoiding the routine use of chlorhexidine. There may be individual patient, clinical circumstances that necessitate the use of oral chlorhexidine, but this decision should be made in consultation and agreement with the multiprofessional team and in line with local hospital policies which should include the prescribing of chlorhexidine on the prescription chart.

Cetylpyridinium chloride oral rinse has been found to be effective in removing plaque and preventing gingivitis.[58,66,67] This may also be considered for an oral care cleaning solution.

4.5 | Toothpaste

Consensus statement regarding use of toothpaste:

1. There is limited evidence to suggest toothpaste can reduce the bacterial bioburden in the oral cavity, however, toothpaste can reduce the risk of plaque formation and cavities. If toothpaste is used, ensure it is effectively removed from the oral cavity. Between episodes of brushing, consider using a debriding agent to assist in removal of dental plaque (Weak, 4).

4.5.1 | Discussion

There is limited evidence to suggest toothpaste can reduce the bacterial bioburden in the oral cavity, but toothpaste has been shown to aid in the breakdown of oral debris.[37,44,68,69] Hydrogen peroxide can also be used as a debriding agent; solutions of greater than 1% and less than 3% have been proven to be safe and effective for removal of plaque and maintaining gingival health.[26,69,70]

Consensus statement regarding oral care in the non-ventilated patient:

1. Oral care should be provided for patients who are unable to manage their own oral care or who cannot safely manage their own secretions (Strong, 1)
2. Non-ventilated patients should have an oral assessment completed within 6 hours of admission using a recognized oral care assessment tool and the results of the assessment documented. The tools suggested for oral assessment of ventilated patients are also appropriate for non-ventilated patients (Strong, 3)
3. Oral care for non-ventilated patients should be the same as oral care for ventilated patients with the same intervals of frequency, with accommodation in the schedule as appropriate for the patient's condition, preferences (consent), and continuity of sleep (Strong, 3)

See Table 3 for detailed oral care equipment, and procedure including rationale.

4.5.2 | Discussion

Most studies cited have focused on oral care in hospitalized patients who are either critically ill or mechanically ventilated. However, oral care in patients who are unable to manage their own oral health care has also been shown to be of benefit. In a study of nursing home patients, it was found that regular oral care helped reduce the rates of cheilitis and stomatitis.[71]

4.6 | Technique for cleaning dentures

Consensus statement regarding cleaning dentures:

1. Daily cleaning using mechanical action—brushing with a toothbrush or denture brush and an effective, non-abrasive denture cleanser is recommended (Strong, 3). Frequency may be increased depending on patient needs.

2. Soaking dentures daily in a denture-cleansing solution seems to deliver additional chemical breakdown of the remaining plaque with some further level of disinfection of the denture (Moderate, 3). It is important that denture cleansing solutions are only used outside of the mouth and that manufacturers' recommendations are followed.
3. Denture wearers should not keep their dentures in the mouth overnight, unless there are specific reasons for keeping them in (Moderate, 4). This may reduce the risk of fungal infection and allow the tissues time to heal.[72]
4. Soaking dentures in a denture cleanser solution after mechanical cleaning seems to be beneficial for preventing denture stomatitis and the potential risk of pneumonia events, for patients at higher risk of developing stomatitis, for example the frail or institutionalized older people (Weak, 4).
5. For the specific care of dentures refer to the Oral Health Foundation 2018 guidelines.[72] https://www.dentalhealth.org/denturecareguidelines

4.6.1 | Discussion

Regular cleaning and maintenance of dentures is vital for the oral care of denture wearers. There is limited evidence concerning the process of cleaning dentures and there are inconsistent practices relating to denture cleaning. There is huge variation between countries and limited high-level evidence to support guidelines with dental opinion leaders providing different recommendations.[72] A Cochrane review supported inconsistencies in denture care and the lack of evidence to support high quality evidence-based recommendations.[73] This has led to the Oral Health Foundation in 2018 providing best practice recommendations for the care of dentures.[72]

5 | CONCLUSION

The greatest challenge of developing evidence-based guidelines is identifying well-designed, adequately powered studies to support the guidance. This expert consensus group reviewed the literature to generate best-available evidence recommendations. They have used their collective experience in critical care nursing care to develop a consensus statement on best practices for oral care in the critically ill adult patient. Whilst high quality evidence may be limited, there is a clear association that effective oral care reduces the incidence of VAP and promotes patient comfort and care. Critical care units need to ensure that policies and practices are in place to promote effective oral care programmes and health care professionals need to be provided with education and training to ensure compliance to an oral care programme.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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