

The Importance Of Oral Health Care Optimization In Bedridden Medicocompromised Patients: A Case Series

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ABSTRACT

Background: Bedridden patients were highly susceptible to oral complications due to prolonged immobilization, impaired oromotor function, and limited capacity for self-care. The accumulation of debris and reduced salivary flow can become pathological, leading to infection in the oral cavity. This case report aims to describe two cases of medico-compromised bedridden inpatient highlighting the importance of optimizing oral health care.

Case Report: Two bedridden inpatients were referred to Oral Medicine Division, Universitas Indonesia hospital from internist. First case, was a 59-year-old female inpatient with stage IV breast carcinoma and bone metastasis. The second case, was a 68-year-old male inpatient with acute encephalopathy and multiple comorbidities. Both patients shows decreased consciousness, severe oral dryness with high Clinical Oral Dryness Scores (CODS), poor oral hygiene with a abundant plaque and debris, inflamed periodontal tissue and lip lesion. Oral health care maintenance by cleaning and wiping teeth and oral mucosa using sterile gauze moistened in 0.9% NaCl was done and demonstrated to caregiver to be done daily. Petroleum Jelly was perscribe for the lips lesions. Both patients showed improved mucosal hydration, debris reduction, and greater comfort. Oral cavity infection is one of the factors that plays an important role in accomplishing the successful overall treatment while bedridden patients had increased risks of oral infection due to limited abilities. Cleaning and wiping with 0,9% NaCl was a safe choice for patient with high risk of aspiration, had a mild antiseptic properties and maintain mucosal hydration.

Conclusion: Optimization of oral care in bedridden patients begin with the selection of oral health care maintenance methods by considering the patient's systemic condition.

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INTRODUCTION

Limited mobilization in bedridden patients can interfere the motor function, causing various problems including problems in the oral cavity such as reduced oral stimulation and increased accumulation of debris and secretions. All of these conditions lead to the formation of pathological oral membranes which then causing inflammation, infection and worsen the patient's discomfort.^{1,2} Elderly patients often experienced difficulties in maintaining oral hygiene, a problem that was worsened by cognitive impairments such as dementia.³⁻⁶ As a result, oral health frequently deteriorated and was associated with systemic complications including aspiration pneumonia and reduced quality of life. Prolonged hospitalization further aggravated these conditions by limiting functional activity and access to professional care, with reviews confirming that oral health in elderly inpatients commonly declined during treatment.^{7,8}

Simple treatments, such as oral care with physiological solutions, were reported to be clinically beneficial.⁹ Normal saline (0.9% NaCl) was identified as the most appropriate option, as it was isotonic, safe, inexpensive, and readily available.⁷ Demonstrated its efficacy in reducing inflammation, alleviating mucositis severity, accelerating tissue healing, and improving patient comfort.⁸ Additionally, saline was found to support gingival fibroblast activity and maintain mucosal hydration.

The procedure of cleansing the oral cavity using sterile gauze moistened with 0.9% NaCl was demonstrated to be practical, hygienic, and feasible for routine use by healthcare professionals and caregivers.^{10,11} This method was shown to effectively reduce plaque, debris, and microbial colonization while improving patient comfort, with minimal adverse effects.^{12,13} This case study was conducted to evaluate the effectiveness of a simple oral care intervention, mouth cleansing with sterile gauze soaked in 0.9% NaCl in improving the oral hygiene of bedridden patients in a hospital setting.¹⁰ The method was expected to provide the basis for the development of straightforward, practical, and sustainable oral care practices that could enhance the quality of life of patients with limited mobility.^{11,13}

Oral care is very important, but it is often not given enough attention in bedridden patients. We need a safe, useful, and cheap plan, especially for people who have trouble swallowing or are at high risk of aspiration. Normal saline (0.9% NaCl) is isotonic, readily accessible, and well tolerated; it has been utilized as supportive care to sustain mucosal hydration and promote gentle mechanical cleansing. This case series underscores the clinical significance and justification for employing sterile gauze moistened with 0.9% sodium chloride (0.9% NaCl) as a bedside oral care intervention for bedridden, medically compromised inpatients.

CASE REPORT

This report was presented as a case series of two bedridden inpatients who had been referred to the Oral Medicine Division of Universitas Indonesia Hospital by an internist. The cases were chosen because they were typical of hospitalized patients with severe dry mouth, poor oral hygiene, decreased consciousness, and a high risk of aspiration, where chemical mouthwashes may not be safe or practical. The patients were characterized by the following criteria: decreased consciousness, a Clinical Oral Dryness Score (CODS) of 8 or higher, poor oral hygiene, underlying medical conditions that increased the risk of complications, and family consent for treatment. Clinical data were collected through extraoral and intraoral examinations, depending on the patients' conditions, interviews with family members (alloanamnesis), and photographic documentation taken before and after the intervention. Before the intervention, the family gave their permission.

Oral care protocol (used at every bedside session): 1) Getting ready and positioning: The patient's head was raised as much as possible to lower the risk of aspiration. If the person gagged, bit, or was upset, the procedure stopped. 2) Mechanical cleaning: Sterile gauze soaked in 0.9% NaCl was used to gently wipe the lips, buccal and labial mucosa, tongue, palate, gingiva, and teeth. Repeated moistening of thick, dried saliva and blood crusts made them softer, and sterile gauze and forceps were used to carefully remove them. 3) Lip care: To keep the lips from cracking and make them more comfortable, a thin layer of petroleum jelly was put on them and the corners of the mouth at least four times a day. 4) Training for caregivers: Caregivers were shown and told how to do oral care at least twice a day, in the morning and at night, and more often when crusting came back.

CASE 1

A 59-year-old woman, was admitted with a primary diagnosis of stage IV cancer of the left breast with bone metastases. Since June 23, 2025, decreased awareness of her surroundings had been observed, and complete immobility had been present for approximately three months. The bedridden state was caused by the progression of malignancy, which was further exacerbated by ulceration of the left breast and metabolic encephalopathy. Her systemic medical history was documented as chronic renal disease, hypertension, normocytic normochromic anemia secondary to wound bleeding, hypoalbuminemia (2.6 g/dL), elevated liver transaminases, dyspepsia, and a hypercoagulable condition.

During the initial examination, extremely poor oral hygiene was identified, with thick yellow-brown crusted saliva adhered to the labial and buccal mucosa, palate, dorsal tongue, gingiva, and teeth (Figure 1.a). The lips were noted to be dry and cracked, with the presence of dark crusts (Figure 1.b). A traumatic ulcer was observed around tooth 43, while the gingiva appeared pale with marginal hyperemia, and bleeding was elicited upon contact. The Clinical Oral Dryness Score (CODS) was recorded as 10, indicating severe oral dryness. Clinical diagnoses were established as severe dry mouth, bilateral angular cheilitis, traumatic ulceration, cheilosis, periodontitis, multiple radices, and pulp necrosis of tooth 11

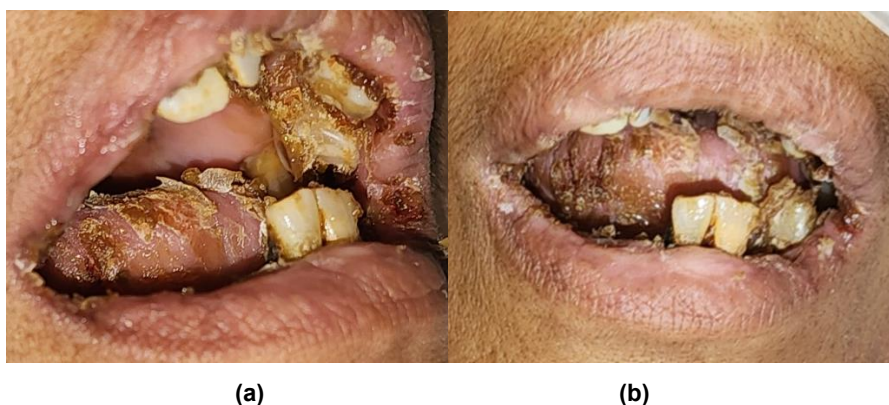


Figure 1. Brownish-yellow dried saliva sticking to the mucosa (a) Dry and chapped lips with brownish crusts (b)

During single intervention, oral cleansing was performed using sterile gauze moistened with 0.9% NaCl, assisted by forceps to remove desiccated saliva and blood crusts. Petroleum jelly was applied to the lips. Within this single session, the oral surfaces became visibly cleaner and mucosal moisture improved; any mild erythema observed after manipulation was transient (Figure 2.a). Caregivers were told to keep doing oral care twice a

day, which included swabbing the mouth, wiping the lips with wet gauze, putting petroleum jelly on the lips, and washing the teeth with gauze from the gingival border to the teeth one at a time.

After the operation, the mucosa looked more hydrated, there were less crusts of saliva and blood, and the general moisture in the mouth improved (Figure 2.b). The procedure was relatively easy to perform, could be demonstrated to caregivers, and did not cause adverse effects. Mild erythema observed after manipulation was well tolerated and did not lead to further complications.

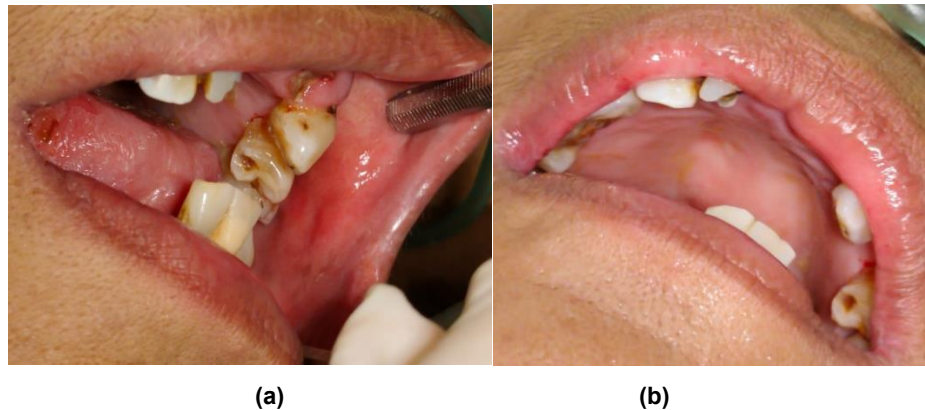


Figure 2. Hiposalivation and mucosal moisture significantly improved (a) No irritation + No bleeding after wiping (b) **CASE 2**

On June 26, 2025, a 68-year-old man, was admitted. The primary diagnosis was documented as acute encephalopathy accompanied by delirium, chronic intracerebral hemorrhage (ICH), septic shock, and stage V chronic kidney disease (CKD), which necessitated frequent hemodialysis. During hospitalization, complete immobility was observed as the patient exhibited limb weakness, reduced alertness, and generalized physical decline. A medical history of hypertension, type 2 diabetes mellitus, chronic anemia, and congestive heart failure (CHF) was also recorded.

During the initial oral examination, poor dental hygiene was identified, characterized by the presence of plaque, debris, stains, and calculus. The lips were noted to be dry with brownish crusts. The labial and buccal mucosa displayed dry saliva mixed with blood (Figure 3.a). The tongue appeared markedly dry and was covered by a thick layer of saliva and blood. The gingiva was observed to be pale with mild marginal redness. Dark areas of dried blood were also identified in the mandibular region (Figure 3.b). The Clinical Oral Dryness Score (CODS) was recorded as 8, indicating pronounced oral dryness. The clinical diagnoses were established as significant oral dryness, cheilosis, poor oral hygiene, partial edentulism, and gingival recession.

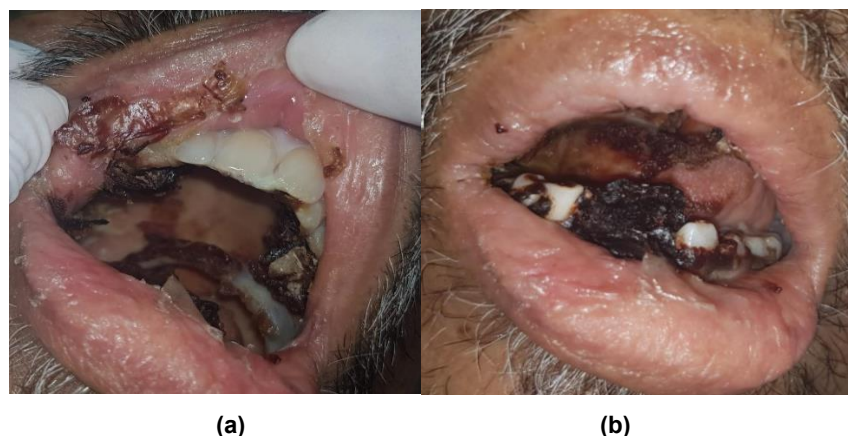


Figure 3. Saliva mixed with dried blood (a) Black spots due to dried blood in the lower jaw region (b)

During single bedside session, sterile gauze moistened with 0.9% NaCl was used to clean the mouth, and forceps were used to remove dried saliva and blood crusts. The lips were covered in petroleum jelly. During this one session, the oral surfaces became noticeably cleaner, and the moisture in the mucosa improved (Figure 4.b). Any mild erythema that was seen after manipulation was only temporary. After the intervention, the mucosa was observed to be more hydrated, with a reduction in saliva and blood crusts, and an overall improvement in oral moisture (Figure 4.b). The procedure was considered relatively easy to perform, was successfully demonstrated to caregivers, and was not associated with adverse effects. Mild erythema that appeared following manipulation was well tolerated and did not progress to further complications.

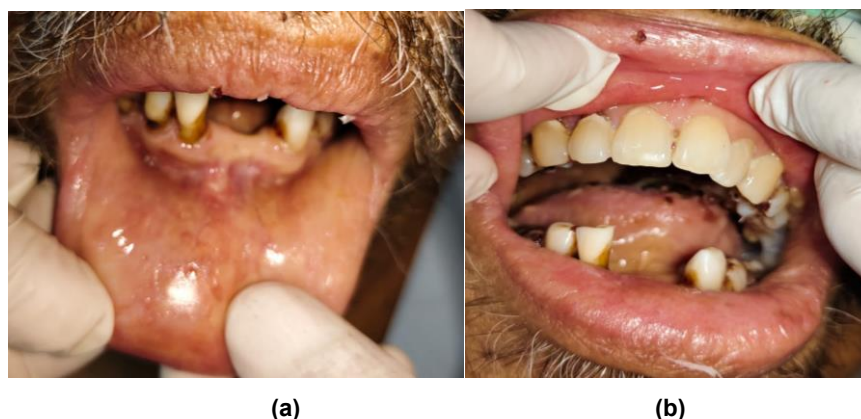


Figure 4. The mucosal surface looks cleaner and moister (a) Saliva and blood crusts are significantly reduced (b)

DISCUSSION

Bedridden patients were recognized to be at high risk of developing oral health problems, as mobility was reduced, neuromuscular function was impaired, and multiple systemic illnesses were frequently present.¹⁴ In such situations, decreased saliva production was often observed, which led to the accumulation of debris, plaque, and excessive dryness, eventually resulting in the formation of pathological membranes on the mucosa. The inability of patients to care for their own mouths emphasized the importance of oral hygiene assistance provided by healthcare workers and caregivers.^{1,11}

Numerous studies had demonstrated that insufficient dental care in hospitalized or long-term immobilized patients increased the risk of systemic consequences, such as aspiration pneumonia and healthcare associated infections. Therefore, oral hygiene maintenance was considered not only a matter of comfort but also a vital preventive measure against severe medical complications in patients with restricted mobility.⁵

When severely ill patients required assistance with oral hygiene, antiseptic agents such as chlorhexidine, povidone-iodine, or herbal rinses were frequently utilized. However, adverse effects including dysgeusia, tooth discoloration, mucosal irritation, and aspiration risks, particularly in dysphagic patients were commonly reported.^{9,12} Consequently, the need for safer, more affordable, and simpler alternatives for both hospital based and home based oral care was highlighted.

Physiological saline (0.9% NaCl) was identified as an appropriate choice due to its isotonic properties and demonstrated efficacy in various clinical settings, including radiotherapy induced mucositis, postoperative xerostomia, and microbial colonization control.^{8,10,12} Saline was shown to maintain mucosal hydration, dislodge debris, and accelerate wound healing by supporting gingival fibroblast migration. Compared with chemical antiseptics, saline produced fewer side effects, was suitable for long term use, and was widely available. From a biophysical perspective, 0.9% NaCl, being isotonic with extracellular fluid (308 mOsm/L; Na⁺ 154 mEq/L, Cl⁻ 154 mEq/L), neither extracted water from nor swelled epithelial cells, thereby preserving cell volume and maintaining comfort on compromised mucosa. On mucous lined oral surfaces, isotonic saline was reported to restore periciliary/mucus layer hydration, improve mucus rheology (viscosity–elasticity, adhesion–cohesion), facilitate secretion clearance, and enhance the sensation of oral moisture. Clinically, saline-based regimens were well tolerated and widely recommended in supportive care for head and neck patients as well as in postoperative oral discomfort.^{14,15}

Importantly, plain water, which is hypotonic relative to body fluids, was reported to cause discomfort on ulcerated or inflamed mucosa and did not provide osmotic stability. In contrast, isotonic saline enabled gentle mechanical cleansing while preserving surface hydration. In oncology and mucositis care, such regimens were associated with symptom relief and improved patient reported outcomes. Small incidental ingestion of 0.9% NaCl was considered low risk due to its similarity to extracellular fluid composition, although deliberate ingestion of large volumes was not advised.^{8,14,15}

A misconception that saline reduced surface tension was clarified, as NaCl did not act as a surfactant. The improved wetting effect observed with saline was instead attributed to rehydration and lubrication provided by salivary mucins and proteins.^{10,12} Thus, the clinical value of saline was attributed to osmotic compatibility and mucous film support rather than detergent or antimicrobial activity. In the present cases, gauze swabbing with 0.9% NaCl successfully loosened and removed dried saliva, diminished debris, and improved mucosal hydration without causing irritation or bleeding. These findings were consistent with supportive care evidence in mucositis management, where regular application was essential, as saline lacked antimicrobial substantivity. Microbial burden was primarily reduced through mechanical removal, while a moist, tolerable oral environment was preserved. Antiseptic rinses such as chlorhexidine reduced microbial load but carried drawbacks including staining, mucosal irritation, and aspiration risks; recent evidence questioned their routine use in ventilated adults outside selected indications.^{10,16–18}

Contemporary ICU data emphasized the importance of structured oral care protocols based on mechanical debridement (toothbrushing, swabbing, or gauze wiping). Training programs for nurses and caregivers were shown to improve knowledge, adherence, and outcomes in both acute and long term care. In practice, techniques were individualized: soft bristled brushing for cooperative patients, foam swabs or gauze and saline wiping for those at high aspiration risk or with impaired consciousness, and saliva substitutes for xerostomia relief. This saline centered manual approach was inexpensive, widely available, and well tolerated, features especially relevant in resource limited settings, while antiseptic agents were reserved for carefully selected cases.^{4–6,14–17,19}

The rationale for selecting 0.9% NaCl are safety and how well it works with mucous membranes. Isotonic saline is more like extracellular fluid osmolarity and is usually easier on damaged mucosa than hypotonic water, which can sting on inflamed surfaces. Saline applied with gauze helps with gentle mechanical

debridement, softens dried secretions, and keeps the surface hydrated while lowering the risk of aspiration compared to liquid rinses or irritating antiseptics. This method highlighted the appreciated value of isotonic saline compared with antiseptic based regimens.^{2,12} The technique had potential to prevent severe complications such as aspiration pneumonia while enhancing patient comfort, making it especially relevant in resource constrained healthcare environments.^{7,20}

Oral infection was emphasized as a critical factor influencing treatment outcomes in immobilized patients. Regular cleaning and wiping with isotonic saline not only provided a safe and well tolerated choice for patients at aspiration risk but also supported mucosal hydration, improved mucous film function, and integrated seamlessly into caregiver protocols. This approach was considered beneficial for both preventive and therapeutic purposes in bedridden, medically compromised individuals. A limitation is that normal saline has limited antimicrobial substantivity. The benefits depend on using it often and removing it mechanically instead of chemically. It may be necessary to provide caregivers with regular training and keep an eye on their compliance. For bedridden patients who are medically compromised, wiping with saline moistened gauze is a good balance of safety and effectiveness.^{2,6,10,18}

CONCLUSION

Cleaning of bedridden patients' lips with sterile gauze soaked in 0.9% physiological saline was shown to be effective in removing debris, softening and eliminating dried saliva deposits, and restoring mucosal hydration without adverse effects.⁷ The procedure was considered simple, safe, inexpensive, and feasible to be performed regularly by healthcare workers or caregivers without specific training.^{8,10,11}

This case study demonstrated that manual cleansing with isotonic saline represented a practical option that could be incorporated into hospital care plans for immobilized patients at high risk of dry mouth.¹⁸ Regular application, particularly in patients with reduced consciousness or nasogastric tubes, was observed to prevent both oral and systemic complications such as secondary infections and aspiration pneumonia.^{12,13}

This type of care was found not only to improve comfort and oral cleanliness but also to enhance overall patient safety and quality of life, both at home and in hospital settings. Identification of appropriate oral care strategies tailored to systemic health was regarded as essential, especially in resource limited healthcare facilities.⁹

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

1. Pattanaporn K, Kaewduangsaeng A, Panich I, Limpaphan N, Lakboon W, Brondani M. Caregivers' knowledge, attitudes and behaviour towards the daily oral care of bedridden patients in Chiang Rai, Thailand. *Gerodontology*. 2025;42(1):71–77. doi:10.1111/ger.12772
2. Di Fede O, Canepa F, Maniscalco L, Tozzo P, Matranga D, Giuliana G. Prevention and treatment of oral mucositis: efficacy of sodium bicarbonate versus other agents: a systematic review. *BMC Oral Health*. 2023;23(1):1–13. doi:10.1186/s12903-022-02586-4
3. Verma P, Prasad R, Kumar N, Jaral S. Practicing oral medicine and radiology in private setup: a comprehensive review. *J Indian Acad Oral Med Radiol*. 2020;32(1):37–40. doi:10.4103/jiaomr.jiaomr_207_19
4. Asadi N, Jahanimoghadam F. Oral care of intubated patients: challenging task of ICU nurses—a survey of knowledge, attitudes and practices. *BMC Oral Health*. 2024;24(1):925. doi:10.1186/s12903-024-04652-5
5. dos Santos AA, Silva LD, Santos CC, Fonseca-Silva T. Oral care practices for patients in intensive care unit: a systematic review. *Int J Dent Hyg*. 2025;23(1):80–88. doi:10.1111/idh.12822
6. Kelly N, Blackwood B, Credland N, et al. Oral health care in adult intensive care units: a national point prevalence study. *Nurs Crit Care*. 2023;28(5):773–780. doi:10.1111/nicc.12919
7. Kristyaningsih P. Povidone iodine 1% and normal saline as a gargling solution to prevent oral mucositis. *Quality Health*. Accessed August 14, 2025. Available from: www.qualityhealth.com
8. Kim DH, Park JS. Effect of saline gargling on dry mouth and sore throat in patients with thyroidectomy. *Asian Oncol Nurs*. 2020;20(4):160–170. doi:10.5388/aon.2020.20.4.160
9. Firouzian A, Darvishi Khezri H. Review of common mouthwashes for oral care utilised by nurses in critically intubated patients. *Int J Caring Sci*. 2014;7:711–720. Available from: www.internationaljournalofcaringsciences.org
10. Huijghebaert S, Hoste L, Vanham G. Essentials in saline pharmacology for nasal or respiratory hygiene in times of COVID-19. *Eur J Clin Pharmacol*. 2021;77(9):1275–1282. doi:10.1007/s00228-021-03102-3
11. Naibaho EN, Dharmajaya R, Harahap IA. Effectiveness of oral care using normal saline and baking soda towards pain and comfort in mucositis patients undergoing chemotherapy. *Indones J Nurs*. 2020;11:1–8.
12. Nokam Kamdem GSJ, Toukam M, Ntep Ntep DB, et al. Comparison of the effect of saline mouthwash versus chlorhexidine on oral flora. *Adv Oral Maxillofac Surg*. 2022;6:100273. doi:10.1016/j.adoms.2022.100273
13. Calvo-Guirado JL, Domínguez MF, Aragonese JM, et al. Evaluation of a seawater-based mouth rinse versus chlorhexidine 0.2% in reducing plaque and gingivitis: a randomized controlled pilot study. *Appl Sci (Basel)*. 2020;10(3):982. doi:10.3390/app10030982
14. Xia J, Tao X, Hu Q, et al. Expert consensus on the prevention and treatment of radiochemotherapy-induced oral mucositis. *Int J Oral Sci*. 2025;17(1):1–14. doi:10.1038/s41368-025-00382-8
15. Zhang Z, Tian L, Liu J, Jiang H, Wang P. Evidence summary on managing radiotherapy-induced oral mucositis in patients with head and neck cancer. *Asia Pac J Oncol Nurs*. 2024;11(3):100386. doi:10.1016/j.apjon.2024.100386
16. De Cassai A, Pettenuzzo T, Busetto V, et al. Chlorhexidine is not effective at any concentration in preventing ventilator-associated pneumonia: a systematic review and network meta-analysis. *J Anesth Analg Crit Care*. 2024;4(1):1–9. doi:10.1186/s44158-024-00166-2
17. Simmons JSC, Bourgault AM, Sole ML, Peach BC. A review of chlorhexidine oral care in patients receiving mechanical ventilation. *Crit Care Nurse*. 2024;44(3):45–53. doi:10.4037/ccn2024995
18. Austin W, Hdeib M, Fraser P, et al. Oral lubrication, xerostomia, and advanced macromolecular lubricants for treatment of dry mouth. *Lubricants*. 2024;12(4):126. doi:10.3390/lubricants12040126
19. Ehrenzeller S, Klompas M. Association between daily toothbrushing and hospital-acquired pneumonia: a systematic review and meta-analysis. *JAMA Intern Med*. 2023;184(2):131–140. doi:10.1001/jamainternmed.2023.6638
20. Kiabi FH, Baradari AG, Kiasari AZ, Shahheidari M. Difference in mouthwash side effects of persica and chlorhexidine for preventing ventilator-associated pneumonia in ICU patients. *Open Public Health J*. 2023;16(1):e230607. doi:10.2174/18749445-v16-e230607-2022-134