

Effects of Systematic Oral Care in Critically Ill Patients: a Multicenter Study

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Article published in AJCC in September 2011

Pulmonary Critical Care



EFFECTS OF SYSTEMATIC ORAL CARE IN CRITICALLY ILL PATIENTS: A MULTICENTER STUDY

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CE 1.0 Hour

Notice to CE enrollees:
A closed-book, multiple-choice examination following this article tests your understanding of the following objectives:

1. Describe the purpose of this study and the measurements used to determine the results.
2. Identify the limitations of evidence-based guidelines for specific oral care procedures and their impact on various outcome measures.
3. Discuss the nursing considerations associated with assessment of oral health in critically-ill patients and the related implications for provision of appropriate oral care for these patients.

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doi: <http://dx.doi.org/10.4037/ajcc.2011.109.9>

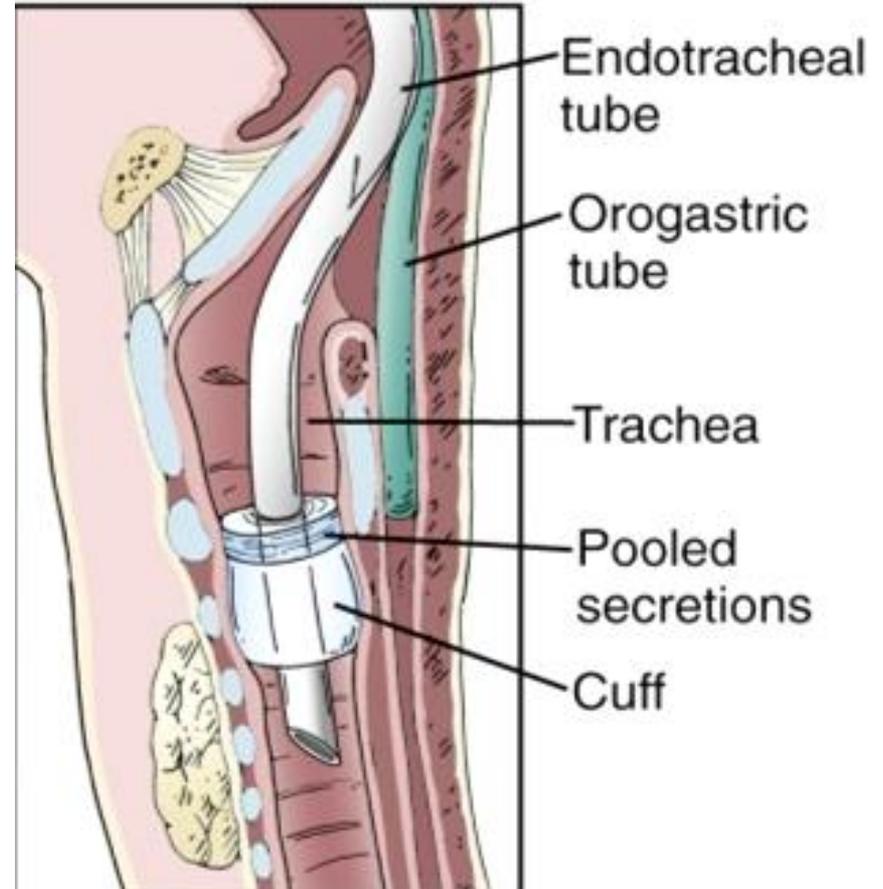
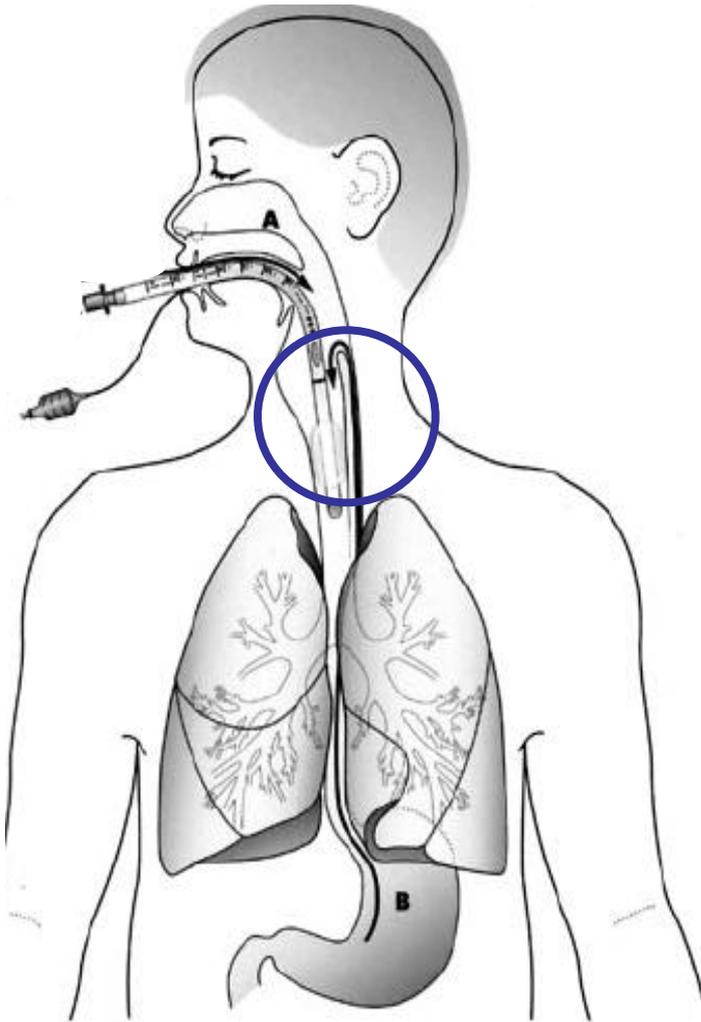
45 (9) AJCC AMERICAN JOURNAL OF CRITICAL CARE, September 2011, Volume 20, No. 5 www.ajcconline.org

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Background: No standard oral assessment tools are available for determining frequency of oral care in critical care patients, and the method of providing oral care is controversial.
Objectives: To examine the effects of a systematic program of oral care on oral assessment scores in critically ill intubated and nonintubated patients.
Methods: Clinical data were collected 3 times during critical care admissions before and after institution of a systematic program of oral care in 3 different medical centers. The oral care education program consisted of instruction from a dentist or dental hygienist and a clear procedure outlining systematic oral care. The Beck Oral Assessment Scale and the mucosal-plaque score were used to assess the oral cavity. Data were analyzed by using linear mixed modeling with controls for severity of illness.
Results: Scores on the Beck Scale differed significantly ($F=4.75, P<.01$) in the pattern of scores across the 3 days and between the control group (before oral education) and the systematic oral care group. Unlike the control group, the treatment group had decreasing scores on the Beck Scale from day 1 to day 5. The mucosal-plaque score and the Beck Scale scores had strong correlations throughout the study; the highest correlation was on day 5 ($r=0.798, P<.001, n=43$).
Conclusions: Oral assessment scores improved after nurses implemented a protocol for systematic oral care. Use of the Beck Scale and the mucosal-plaque score could standardize oral assessment and guide nurses in providing oral interventions. (American Journal of Critical Care. 2011;20:9-14)

Ames, N., Sulima, P., Yates, J., McCullagh, L., Gollins, S., Soeken, K., Wallen, G.R. (2011). The Effects of Systematic Oral Care in Critically Ill Patients: A Multicenter Study. *American Journal of Critical Care* DOI 10.4037

VAP Pathogenesis

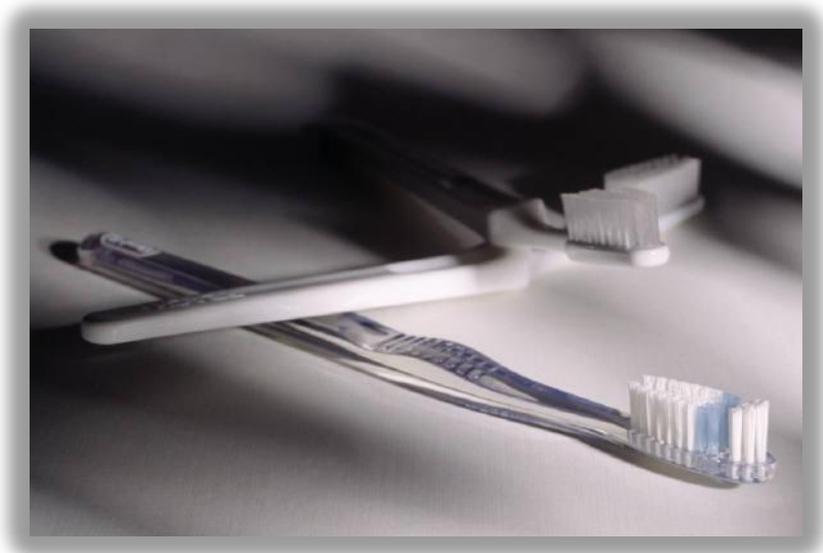


Crnich, Safdar & Maki, *Resp Care* 2005

Craven, D. Chroneou, A. in Mandell, Douglas, and Bennett's *Principles and Practice of Infectious Diseases*, 7th Edition.

Purpose

To examine the effects of a systematic program of oral care on oral assessment scores in critically ill patients.



Background

- No standard oral assessment tools exist to determine oral care **frequency** and **procedure**
 - Treloar and Stechmiller (1995)
 - Oral assessment tool; n=16 intubated patients; no information on psychometric testing and oral assessment lacked quantitative metrics and scales
 - Fitch, et al.(1999)
 - Visual analogue scale as assessment of oral cavity structures; n=30 patients; 3-phase longitudinal study with standardized oral care protocol that included toothbrushing; no information on time need to perform oral assessment
 - Fourrier, et al. (2005)
 - Plaque index score and dental assessment; n=228 intubated patients; placebo-controlled trial of chlorhexidine gel; decreased plaque cultures in chlorhexidine gel group but no difference in rate of VAP or days of mechanical ventilation

Background

- Munro et al. 2009
 - Decayed, missing, and filled teeth index (DMFT); single-center study; studied effects of toothbrushing alone, chlorhexidine alone, and chlorhexidine plus tooth brushing; patients who did not have elevated pneumonia scores at baseline and who received chlorhexidine had reduced pneumonia rates on day 3
- Many performance improvement studies of VAP and oral care have been published
 - In these studies oral care frequency and type were not clearly defined OR they consisted solely of chlorhexidine rinses

Methods

- Oral Cavity assessed using Modified Beck Oral Assessment Scale (BOAS) and Mucosal-Plaque Score (MPS)
- Beck Oral Assessment Scale, modified

Area	Score			
	1	2	3	4
Lips	Smooth, pink, moist, and intact	Slightly dry, red	Dry, swollen isolated blisters	Edematous, inflamed blisters
Gingiva and oral mucosa	Smooth, pink, moist, and intact	Pale, dry, isolated lesions	Swollen red	Very dry and edematous, inflamed
Tongue	Smooth, pink, moist, and intact	Dry, prominent papillae	Dry, swollen, tip and papillae are red with lesions	Very dry, edematous, engorged coating
Teeth	Clean, no debris	Minimal debris	Moderate debris	Covered with debris
Saliva	Thin, watery plentiful	Increase in amount	Scanty and somewhat thicker	Thick and ropy, viscid or mucid
Total score ^b	5 No dysfunction	6-10 Mild dysfunction	11-15 Moderate dysfunction	16-20 Severe dysfunction
Note: Provide moisture more often than oral care.	Minimum care every 12 h	Minimum care every 8-12 h	Minimum care every 8 h	Minimum care every 4 h

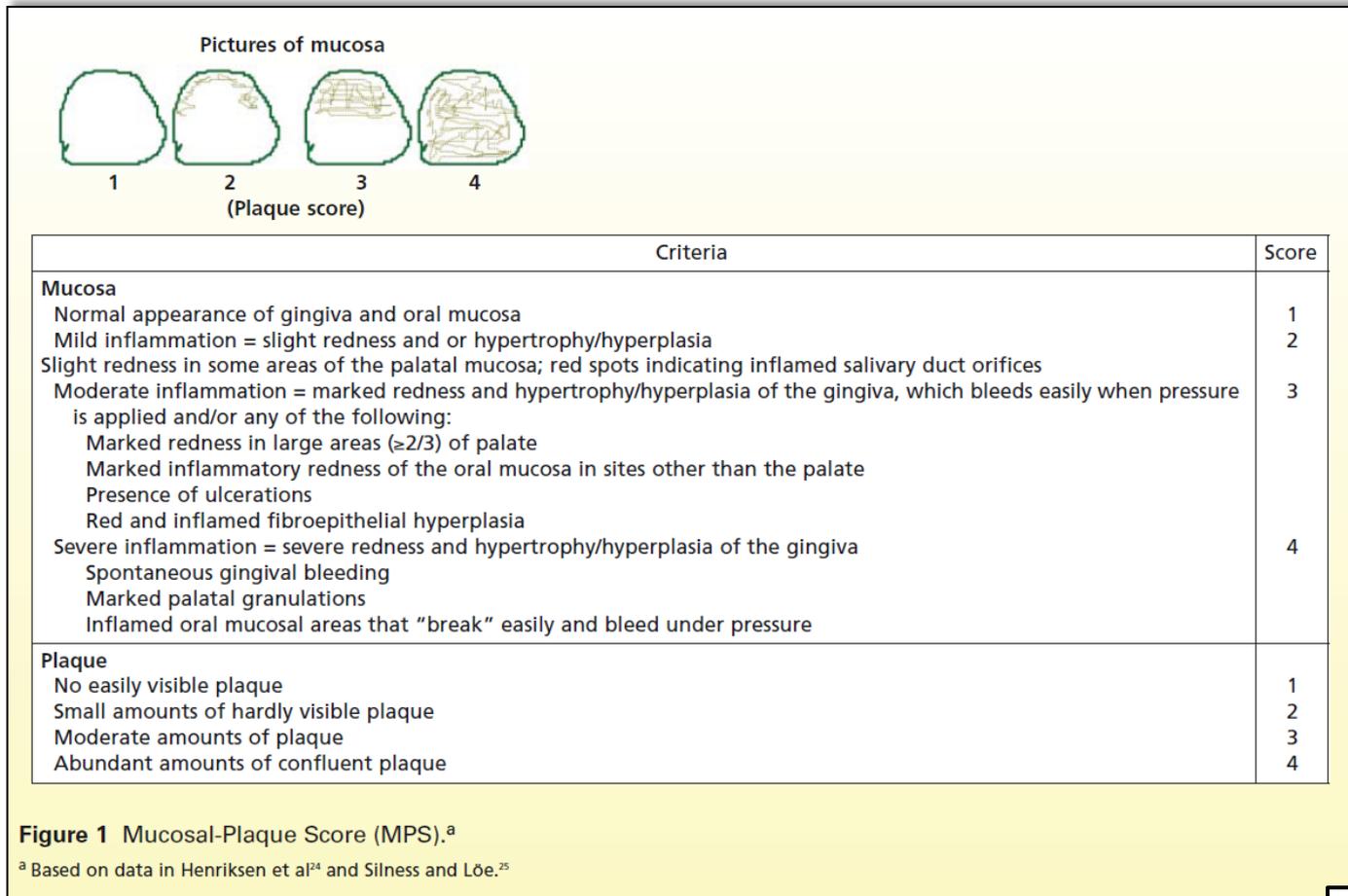
^a Modified from Beck.²²

^b Interpretation of total score:
 BOAS 0 - 5: Perform an oral assessment once a day. Follow oral care as outlined in the systematic oral care procedure twice per day.
 BOAS 6 - 10: Perform oral assessments twice a day. Moisten mouth/lips every 4 hours. Follow oral care as outlined in the systematic oral care procedure twice per day.
 BOAS 11 - 15: Perform an oral assessment every shift (every 8-12 h). Follow oral care as outlined in the systematic oral care every shift. Use an ultra-soft toothbrush. Moisten lips and mouth every 2 h.
 BOAS 16 - 20: Perform an oral assessment every 4 hours. Follow oral care as outlined. If brushing not possible, use soft gauze-wrapped finger. Moisten lips and mouth every 1 - 2 h.

Ames, et al., 2011

Methods

- Mucosal Plaque Score



Ames, et al., 2011

Methods

- Multicenter study between November 2004 and January 2007
- Pre-post evaluation of oral care practices
- Standard unit-based oral care before the educational intervention and the subsequent implementation of systematic oral care
- All patients were assessed and plaque and saliva specimens were collected
- Data were collected at day 1, day 3, and day 5

Methods

- Exclusion criteria:
 - ICU LOS < 48 hours
 - Age < 18 yrs of age
 - Significant oral or facial trauma
 - Edentulous
 - Could provide own oral care
 - Diagnosis of pneumonia at admission
 - Clinical Pulmonary Infection Score (CPIS) of ≥ 6
- Acute Physiology and Chronic Health Evaluation (APACHE) II was used to compare severity of illness between hospitals and patients
- Frequency of oral care determined by BOAS score but was at least every 12 hours
- No restrictions were placed on the use of tap water

Limitations

- Pre-post test design and differences between the treatment and control groups
- Length of time between the two parts of the study
- Smaller than anticipated sample size
- Measurement fidelity of treatment

Clinical Implications

- Patients who received systematic oral care had significantly lower BOAS scores overall
- The modified BOAS provides a realistic and clinically useful assessment of oral integrity in critically ill patients
- As the MPS and BOAS correlated positively across all times, both assessment scores can help standardize oral care by providing a mechanism to measure the effects of this important nursing intervention

Thank you!

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