



NSW Speech Pathology Evidence Based Practice Interest Group

Critically Appraised Paper (CAP)

CLINICAL BOTTOM LINE:

The use of a one-way speaking valve (PMSV) may result in improved pharyngeal swallow physiology on thin fluids and some reduction in penetration of the airway. However, due to limited confidence in the study design, we are unable to make strong causal relationships between one-way valves and a reduction in aspiration.

Clinical Question:

In non-ventilated patients with tracheostomy tubes, does occlusion with a one way valve reduce aspiration?

Citation:

Gross, RD; Mahlmann, J & Grayhack, JP (2003). *Physiological effects of open and closed tracheostomy tubes on the pharyngeal swallow*. *Annals of Otology, Rhinology and Laryngology*, 112(2):143-152.

Design/Method:

Within subject ABAB design under 2 conditions (open and closed tracheostomy tubes), with 3 systematic replications

1. Participants seated upright at 90°
2. MBS to observe the pharyngeal stage of the swallow measuring (1) level of penetration/ aspiration (2) bolus transit time (3) pharyngeal activity duration and (4) pre and post swallow subglottic pressure
3. Patients given 3ml of thin fluids with a syringe under both conditions (A-open/B-closed) with AABBAABB presentation

Participants:

- 4 male patients. Age range 49-72 years. Diagnoses: COPD, brainstem infarction, R pneumonectomy, bilateral vocal fold paralysis
- Tracheostomy tubes: 1 Shiley; 3 Portex
- Tracheostomy tubes in situ for: 3wks, 2x 7months, 3 years
- 3 participants wore PMSV continuously during waking hours, 1 wore occasionally.

Control Group: Participants acted as own controls due to 2 conditions (open and closed trache tubes)

Results:

- All participants had greater pharyngeal activity duration and bolus transit time with open trache tube
- 3/4 participants had greater degree of laryngeal penetration with open trache tube
- Subglottic air pressure was greater with a closed trache tube (nil for open trache tube)
- Difference between open and closed trache tube results were greatest for participants who wore PMSV continuously during waking hours.

Comments – Strengths/weaknesses of paper

Strengths:

- Use of MBS for assessment
- Design method

Weaknesses:

- Unnatural feeding method (with syringe in 3ml amounts)
- Only thin fluids were trialled
- Different brands and sizes of tubes may have affected results
- No note of patients' dysphagia status
- Small sample size with no testing of statistical significance of the data

Level of Evidence (NH&MRC): III (2)

Appraised By:

Clinical Group: Tracheostomy Discussion & EBP Group

Date: August 2006