



CLINICAL BOTTOM LINE:

In 22 non-ventilated tracheostomised patients cuff status (inflated vs deflated) had no effect on penetration or aspiration. Of interest despite no change to penetration or aspiration some changes to the swallow was noted between cuff status. The duration of hyoid maximum anterior excursion was found to be significantly longer for deflated cuff vs inflated cuff (but no significant effect on either bolus), and maximum laryngeal elevation was significantly greater for deflated cuff vs inflated cuff (only significant effect on puree bolus).

Clinical [PICO] Question *[Patient/problem, Intervention, (Comparison), Outcome]:*

In patients with a tracheostomy (+/- mechanical ventilation), does an inflated cuff exacerbate / increase aspiration of food or fluids at the level of the vocal folds compared to a deflated cuff?

Citation: Effects of Cuff Deflation and One-Way Tracheostomy Speaking Valve Placement on Swallow Physiology. *Dysphagia* 18; 284-292 (2003).

Method: Design and Procedure *(e.g., note type of research design, comment on randomization, summarize treatment intensity as appropriate, such as dose (trials) per session, session length, frequency, total treatment duration, summarize general procedure, resources / materials required)*

This study has a replicable design. VFSS was completed for all 3 conditions including 1. Cuff Inflated 2. Cuff Deflated/Cuffless tube 3. One way valve. Each of the 3 conditions were presented to two SP therapists randomly who analysed the VFSS and were blinded to cuff status. Each VFSS included 2 Puree boluses and 2 fluid boluses (thin fluids). 7 time of bolus transfer during the oral pharyngeal swallow were examined in each of these conditions.

Method: Participants *(where relevant note number of participants, inclusion/exclusionary criteria, characteristics of participants in experimental group and control group/s):*

Of 22 patients referred for possible aspiration, a total of 18 patients met inclusion criteria (14 cuffed tracheostomies and 4 cuffless tracheostomies). The inclusion criteria were as follows:

- Non ventilator dependence
- Ability to tolerate cuff deflation during VFSS
- No surgery to upper aerodigestive tract except tracheostomy
- No history of stroke or H&N ca
- At least one aspiration occurrence on thin fluid or puree without the one way valve in situ during VFSS (i.e. all dysphagia patients)

13 Males and 5 Females between 19-80 years of age. Reason for tracheostomy was for respiration not obstruction (Respiratory failure, closed head injury). 17 pt's had NGT's in situ, 1 had a PEG. All had Shiley tracheostomy tubes between size 4 – 8.

Time from tracheostomy to VFSS was 29 days. 2-19 days since each patient had been off PSV. All could tolerate one way valve for at least 15 minutes.

Critically Appraised Paper: TREATMENT (CAP-T) *continued....*

Results: (Briefly summarize the results – you could note whether the outcome was evaluated with/without blinding; note how many (if any) of the participants ‘dropped out’ of the study; note if **effect size** was reported, and what it was – see manual for more information about effect sizes.)

- Cuff status (inflated vs deflated) had no effect on penetration or aspiration
- The majority of penetration and aspiration occurrences were silent, highlighting the importance of objective assessment
- Duration of hyoid maximum anterior excursion was significantly longer for deflated cuff vs inflated cuff (but no significant effect on either bolus). Maximum laryngeal elevation was significantly greater for deflated cuff vs inflated cuff (only significant effect on puree bolus).
- One way valve placement resulted in increased incidence of penetration in conjunction with decreased incidence of aspiration with thin fluids. A similar effect with puree was seen, but only in 3 of 7 participants.
- One way valve did not significantly affect any swallow duration measures or extent of hyolaryngeal elevation.

Level of Evidence (NHMRC, 2009) Circle one I II III-1 III-2 III-3 **IV**

Quality of Evidence: Rated Not Rated

(i) **rating system** (e.g., PEDRo, SCED Scale from SpeechBITE) _____

(ii) **score** _____ *If the paper has not been rated, just check ‘not rated’.*

Nature of Evidence: feasibility efficacy study effectiveness study

Additional comments about level, quality and/or nature of the evidence: (e.g., limitations of the study, need for further research addressing a specific issue; assessors weren’t blind, insufficient baseline or baseline not stable, effect size not reported)

- Small sample size with only 14 tracheostomised patients in the study
- Biased sample with only dysphagia patients being used.
- Clear and replicable methodology
- Validated tools including the 8 point penetration-aspiration scale, hyoid movement distance, residue scale 123 and bolus movement at 7 times during the oral pharyngeal swallow.
- There is inter-rater reliability and intra-judge reliability
- No mention of initial bedside assessment

Relevance to practice (e.g., In this section just note down the clinical groups thoughts about the relevant of the research findings fro clinical practice. Consider some of the following questions - were the participants and/or treatment context similar/different to everyday clinical practice? Is replication possible in clinical practice? What barriers might prevent the results from be applied to everyday clinical practice? What could be done to address barriers? If barriers can’t be modified, how could the procedure be modified to accommodation limitations in clinical practice?)

The methodology, results and discussion of this study provide clinical significance and relevance to current practice in feeding tracheostomised patients (cuff inflated vs cuff deflated). It reflects on the physiological impact of inflated vs deflated vs one way valve and the importance of objective assessment in this population.

Appraised By:
NSW Tracheostomy and Critical Care Discussion / EBP Group

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