



CLINICAL BOTTOM LINE:

Tracheostomy cuff inflation may exacerbate the frequency and degree of aspiration of food and fluids at the level of the vocal folds compared to cuff deflation when examined via MBS. However, due to some limited confidence in the study design, as well as the higher rate in aspiration in cuff inflated status not reaching statistical significance, we are unable to make strong causal relationships between tracheostomy cuff status and aspiration.

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: Davis, D.G., Beras, S., Barone, J.E., Corvo, P.R. and Tucker, J.B. (2002). *Swallowing with a tracheotomy tube in place: Does cuff inflation matter?* Journal of Intensive Care Medicine, 17(3), 132-135.

Method: Design and Procedure

- Prospective blinded analysis
- 8 MBS studies conducted per patient (except 1) with SP administering substances.
 - 4 substances trialled (thin liquid, thick liquid, pureed food, solid food)
 - Trache cuff inflated and deflated
- Silent aspiration defined as lack of coughing and no difficulty breathing during observance of laryngeal penetration of food substances
- Degree of aspiration assessed by radiologist – blinded to cuff status
 - 0 = no aspiration
 - 1 = aspiration <10% with cough/choking/distress
 - 2 = aspiration <10% without cough
 - 3 = aspiration >10% with cough
 - 4 = aspiration >10% without cough
- Frequency of aspiration and cuff status evaluated using logistic regression analysis $p < 0.05$ significant

Method: Participants

- 12 patients with tracheostomies, acted as own controls as assessed under the two variable conditions (cuff up/down)
 - Inclusion criteria:
 - Recently weaned from ventilator
 - Ready to begin oral feeding
 - Stable patients between 1997 and 1999.
 - Exclusion criteria:
 - Haemodynamic instability
 - Inability to be t/f to radiology by wheelchair
 - Unable to maintain upright position
 - Incapable of following commands

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

Results:

- Mean age 60 yrs (range 35-82)
- Reason for trache/mechanical ventilation
 - Post-op ARDS = 7, pneumonia = 3, sepsis/multiorgan failure = 2
- Cuff deflation resulted in fewer episodes of aspiration and reduced severity of aspiration.
- Cuff inflation resulted in 2.7 times higher rate of aspiration (17.8% vs 6.5%), which was nearly statistically significant ($p = 0.0625$).
- Overall aspiration occurred in 11/91 MBS studies (12.1%)
 - Cuff inflated
 - Aspiration occurred in 8/45 MBS studies (17.8%)
 - Aspiration ratings of 0 - 4
 - Cuff deflated
 - Aspiration occurred in 3/46 MBS studies (6.5%)
 - Aspiration ratings of 0 - 2
- Lowest rate of aspiration with solids across both conditions (i.e. nil)
- Statistically significant predictors of aspiration
 - Cuff status ($p = 0.032$): ie: Cuff status was found to be an independent predictor of aspiration.
 - Type of substance ($p = 0.025$) –ie: Thick and pureed substances had a higher risk of aspiration when the cuff was inflated.
- Of the 11 episodes of aspiration, 8 (73%) were silent.

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:

- **STRENGTHS** – Objective, SP involvement, Radiology blinded (single-blinded), range of consistencies examined, same group of patients under two conditions, statistical analyses, pilot study.
- **WEAKNESSES** – Small sample size, only one rater; methodology unclear, nil information re:
 - type/length of time insitu for tracheostomy;
 - order/timing of cuff-up/cuff-down status;
 - previous SP intervention;
 - non-oral nutrition;
 - amounts of trialled materials;
 - views of MBS
 - inter-rater and intra-rater reliability (sensitivity, specificity)
 - Relationship between co-morbidities and results.
 - The rate of silent aspiration across cuff up and cuff down conditions.

Relevance to practice

-

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

Date: Sept 2014