

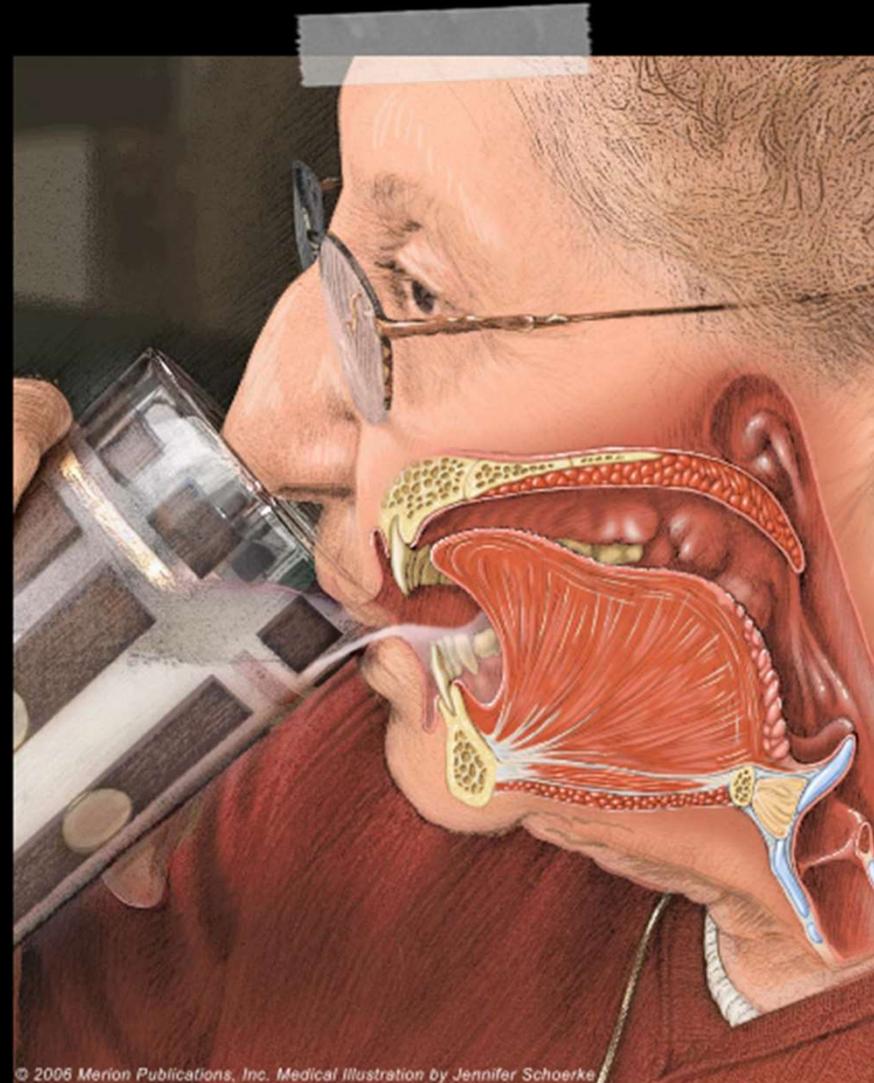
Weniger ist mehr

und es heißt „Schluckventil“!

Trachealkanüle & Schlucken?

Schlucken mit gecuffter TK

- Larynxellevation mechanisch eingeschränkt
- herabgesetzte Sensibilität im Pharynx
- Atem-Schluck-Koordination eingeschränkt
- Schutzreflexe (Husten) nicht effektiv



Alyssa R. Terk et. al. 2007

- Larynx elevation ist durch Trachealkanüle nicht eingeschränkt
- untersucht an 7 Patienten ohne Dysphagie
- geprüft mittels VFS mit 30 Bildern pro Sekunde

Dysphagia 22:89-93 (2007)
DOI: 10.1007/s00455-006-9057-0

Dysphagia
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Hyoid Bone and Laryngeal Movement Dependent Upon Presence of a Tracheotomy Tube

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Abstract. The aim of this prospective, consecutive study was to investigate the biomechanical effects, if any, of the presence of a tracheotomy tube and tube cuff status, tube capping status, and aspiration status on movement of the hyoid bone and larynx during normal swallowing. Seven adult patients (5 male, 2 female) with an age range of 46-82 years (mean = 63 years) participated. Criteria for inclusion were no history of cancer of or surgery to the head and neck (except tracheotomy), normal cognition, normal swallowing, and ability to tolerate decannulation. Digital videofluoroscopic swallowing studies were performed at 30 frames/s and with each patient seated upright in the lateral plane. Variables evaluated included maximum hyoid bone displacement and larynx-to-hyoid bone approximation under three randomized conditions: tracheotomy tube in and open with a 5-cc air-inflated cuff; tracheotomy tube in and capped with deflated cuff; and tracheotomy tube out (decannulated). Differences between maximum hyoid bone displacement and larynx-to-hyoid approximation (cm) based on presence/absence of a tracheotomy tube, tube cuff status, and tube capping status were analyzed with the Student's *t* test. Reliability testing with a Pearson product moment correlation was performed on 21% of the data. No significant differences ($p > 0.05$) were found for both maximum hyoid bone displacement and larynx-to-hyoid bone approximation during normal swallowing based on tracheotomy tube presence, tube cuff status, or tube capping status. Intra-observer reliability for combined measurements of maximum hyoid displacement and larynx-to-hyoid approximation was $r = 0.97$ and interobserver reliability for the absence of aspiration

was 100%. For the first time with objective data it was shown that the presence of a tracheotomy tube did not significantly alter two important components of normal pharyngeal swallow biomechanics, i.e., hyoid bone movement and laryngeal excursion. The hypothesis that a tracheotomy tube tethers the larynx thereby preventing hyoid bone and laryngeal movement during normal swallowing is not supported.

Key words: Pharyngeal swallow biomechanics — Tracheotomy — Tracheotomy tube — Hyoid bone — Larynx — Displacement — Aspiration — Deglutition — Deglutition disorders.

Current knowledge of the synergy between hyoid bone and laryngeal movement in the presence of tracheotomy has been based on inadequate data. The literature begins with conjectures from two often-cited case reports, i.e., "...presence of a tracheotomy tube may alter the mechanics of deglutition to prevent proper elevation of the larynx on swallowing..." [1] and "Fixation of the larynx by the tracheotomy...might prevent normal elevation of the larynx..." leading to "...a disorder of swallowing produced by the tracheotomy" [2] (italics ours). This implied causal relationship between tracheotomy and swallowing has only recently been refuted [3].

Two radiographic studies reported reduced laryngeal elevation during swallowing attributed to an anchoring effect by the tracheotomy tube and resulting in dysphagia [4, 5]. In both studies, however, no objective procedure for measuring laryngeal movement was reported, no statistics performed, and no other potential etiologies for dysphagia investigated.

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R. Amathieu et.al. 2012

- gecuffte Manschette hat negativen Einfluss auf Schluckreflextriggerung
- schlechtere Larynx elevation
- motorische Aktivität des Schluckens und Effektivität des Schluckens eingeschränkt
- gemessen über EMG

British Journal of Anaesthesia 109 (4): 578–83 (2012)
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BJA

CRITICAL CARE

Influence of the cuff pressure on the swallowing reflex in tracheostomized intensive care unit patients

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Editor's key points

- The recovery of the swallowing reflex is key to weaning from tracheostomy.
- A cuffed tracheostomy tube anchors the trachea to the anterior neck tissues and interferes with swallowing.
- This study in intensive care patients demonstrated that the presence of a cuffed tube interferes with both the latency and magnitude of the swallowing reflex.
- The effect increased with greater cuff pressures, especially above 25 cm H₂O.

Background. Because recovery of an efficient swallowing reflex is a determining factor for the recovery of airway protective reflexes, we have studied the influence of the tracheostomy tube cuff pressure (CP) on the swallowing reflex in tracheostomized patients.

Methods. Twelve conscious adult intensive care unit (ICU) patients who had been weaned from mechanical ventilation were studied. Simultaneous EMG of the submental muscles with measurement of peak activity (EMGp) and amplitude of laryngeal acceleration (ALA) were performed during reflex swallows elicited by pharyngeal injection of distilled water boluses during end expiration. After cuff deflation, characteristics of the swallowing reflex [latency time: LoT, EMGp, and ALA] were measured at CPs of 5, 10, 15, 20, 25, 30, 40, 50, and 60 cm H₂O.

Results. LoT and CP were linearly related ($P < 0.01$). CP was inversely correlated ($P < 0.01$) to both ALA and EMGp.

Conclusions. We demonstrated that LoT, EMGp, and ALA of the swallowing reflex were influenced by tracheostomy tube CP. The swallowing reflex was progressively more difficult to elicit with increasing CP and when activated, the resulting motor swallowing activity and efficiency at elevating the larynx were depressed.

Keywords: acceleromyography; airway protection; cuff pressure; electromyography; swallowing reflex; tracheostomy

Accepted for publication: 21 February 2012

The presence of a cuffed tracheostomy tube alters the pharyngeal stage of swallowing. This is believed to be the result of the anchoring of the trachea to the anterior neck tissues, resulting in a reduction in elevation and anterior movement of the larynx, uncoordinated laryngeal closure, and oesophageal obstruction by the cuff in the proximal oesophagus and hypopharynx.^{1–3} Other reasons including oromotor dysfunction and impaired sensation may contribute to disordered deglutition in tracheostomized patients.⁴ During the weaning process from the tracheostomy tube, continuous scoring of swallowing performance is recommended.⁵ When the patient appears to be able to tolerate secretions without difficulties, the cuff is deflated and a swallowing assessment of food and fluid of varying consistencies is undertaken. If any sign of frank aspiration is observed, the cuff is immediately re-inflated. We hypothesized that cuff pressure (CP) in the tracheostomy tube may influence recovery of swallowing. We studied the influence of the CP on the swallow-

Methods

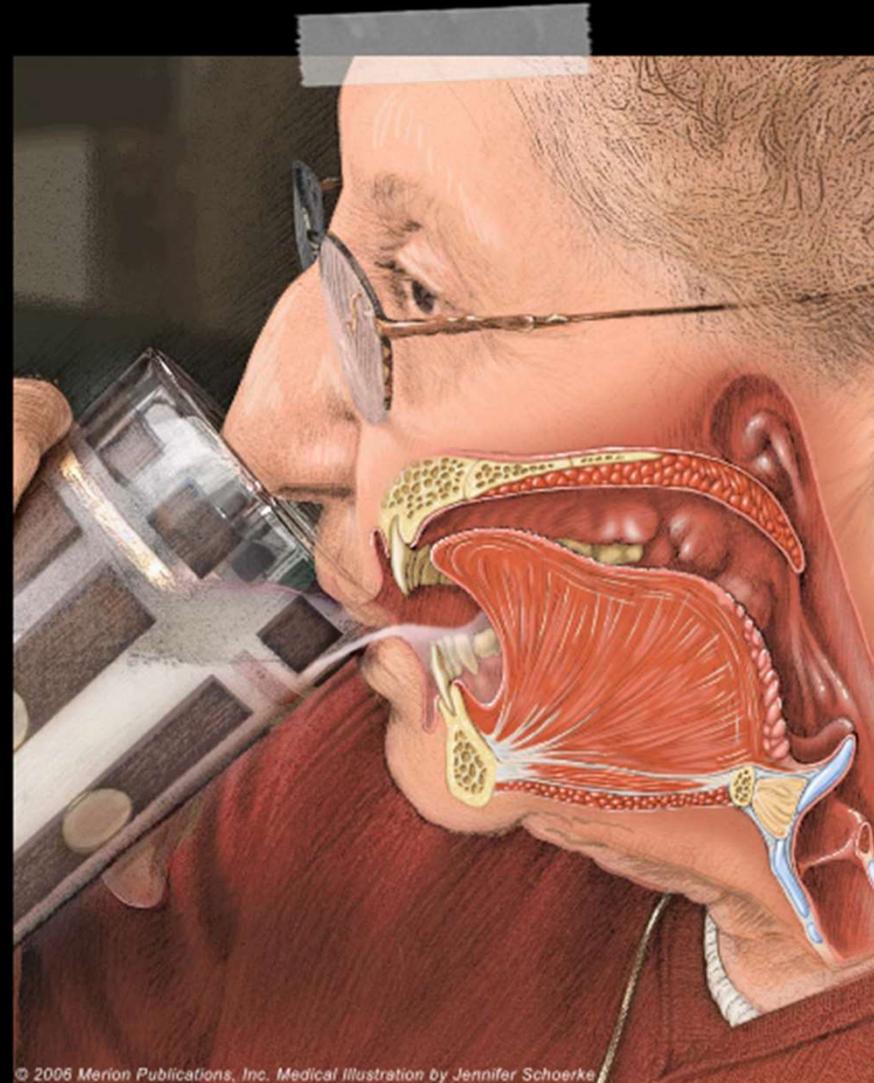
After the local ethics committee approved the protocol and informed consent had been obtained from the patient or relatives, 12 consecutive tracheostomized adult patients who had been weaned from mechanical ventilation were enrolled in the present study.

We studied patients who required intensive care after severe blunt chest trauma. After resolution of the initial pathology, sedation (sufentanil and midazolam titrated on the Ramsay sedation scale) was discontinued and the patients were allowed to recover consciousness. After awaking (Glasgow coma scale of 13–15), dysphagia assessment was undertaken in the intensive care unit (ICU). This included an assessment of the level of consciousness; cranial nerve function; cough capability; oromusculature efficiency; and volitional swallows. A multidisciplinary team including physiotherapists and medical staff decided that patients were fit for inclusion in the study when the patients tolerated

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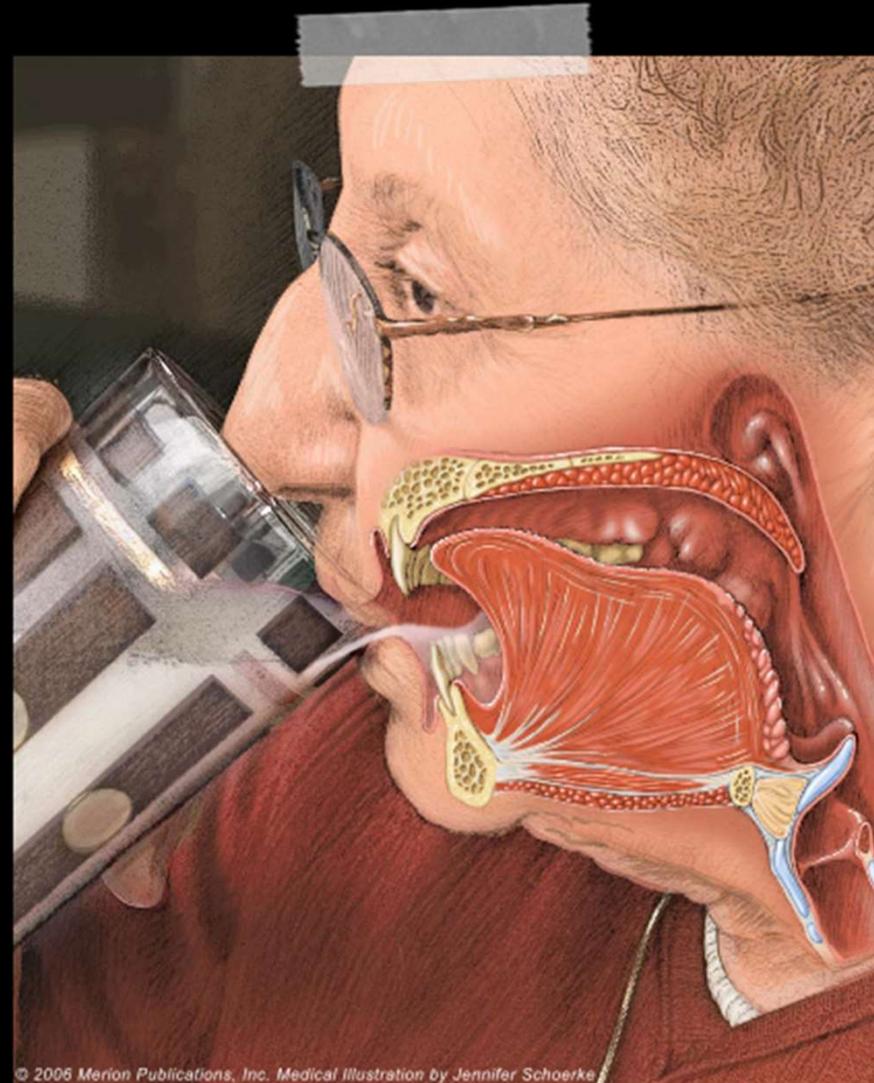
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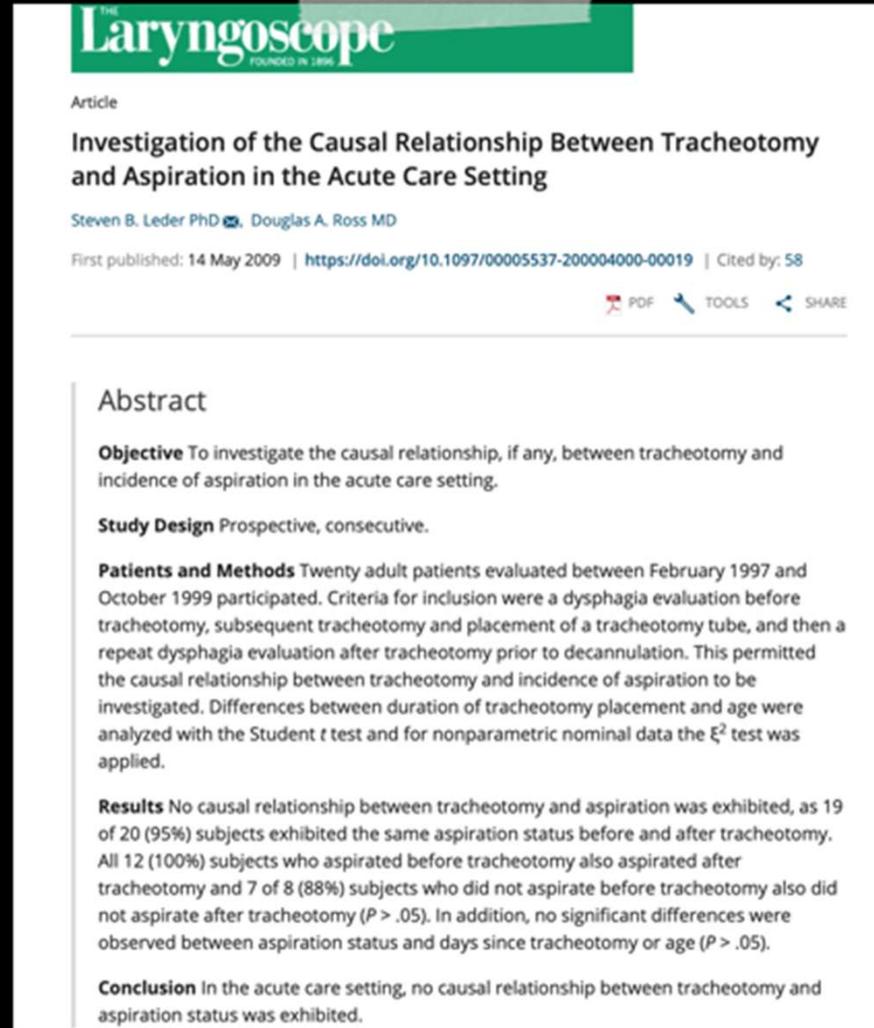
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Steven B. Leder, Douglas A. Ross 2000

- kein Zusammenhang zwischen Tracheotomie und Aspiration
- Untersucht mittels Bildgebung
- 20 Pat, davon nur 12 mit Aspiration
- Zeitpunkt der Untersuchung vor der Tracheotomie bis zu 63 Tage
- keine genaue Beschreibung der Aspiration wie Quantität und Reaktion



The Laryngoscope
FOUNDED IN 1893

Article
Investigation of the Causal Relationship Between Tracheotomy and Aspiration in the Acute Care Setting

Steven B. Leder PhD, Douglas A. Ross MD

First published: 14 May 2009 | <https://doi.org/10.1097/00005537-200004000-00019> | Cited by: 58

PDF TOOLS SHARE

Abstract

Objective To investigate the causal relationship, if any, between tracheotomy and incidence of aspiration in the acute care setting.

Study Design Prospective, consecutive.

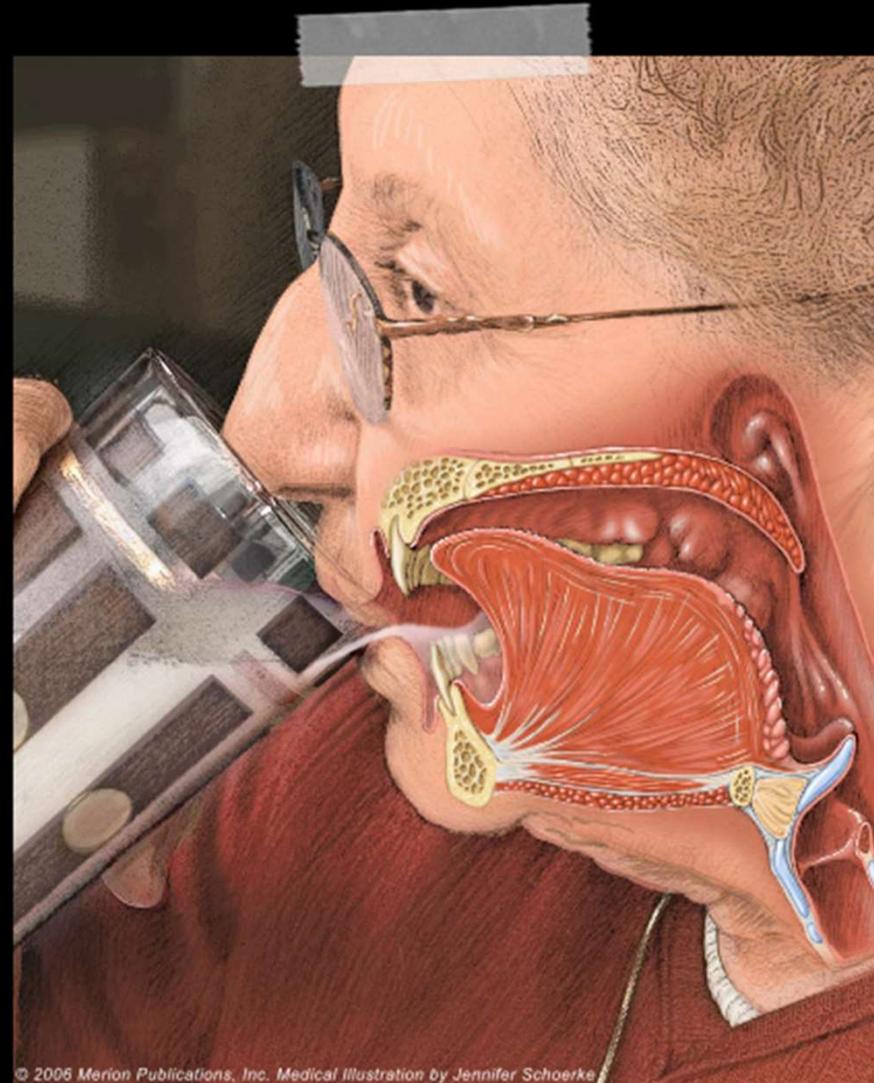
Patients and Methods Twenty adult patients evaluated between February 1997 and October 1999 participated. Criteria for inclusion were a dysphagia evaluation before tracheotomy, subsequent tracheotomy and placement of a tracheotomy tube, and then a repeat dysphagia evaluation after tracheotomy prior to decannulation. This permitted the causal relationship between tracheotomy and incidence of aspiration to be investigated. Differences between duration of tracheotomy placement and age were analyzed with the Student *t* test and for nonparametric nominal data the χ^2 test was applied.

Results No causal relationship between tracheotomy and aspiration was exhibited, as 19 of 20 (95%) subjects exhibited the same aspiration status before and after tracheotomy. All 12 (100%) subjects who aspirated before tracheotomy also aspirated after tracheotomy and 7 of 8 (88%) subjects who did not aspirate before tracheotomy also did not aspirate after tracheotomy ($P > .05$). In addition, no significant differences were observed between aspiration status and days since tracheotomy or age ($P > .05$).

Conclusion In the acute care setting, no causal relationship between tracheotomy and aspiration status was exhibited.

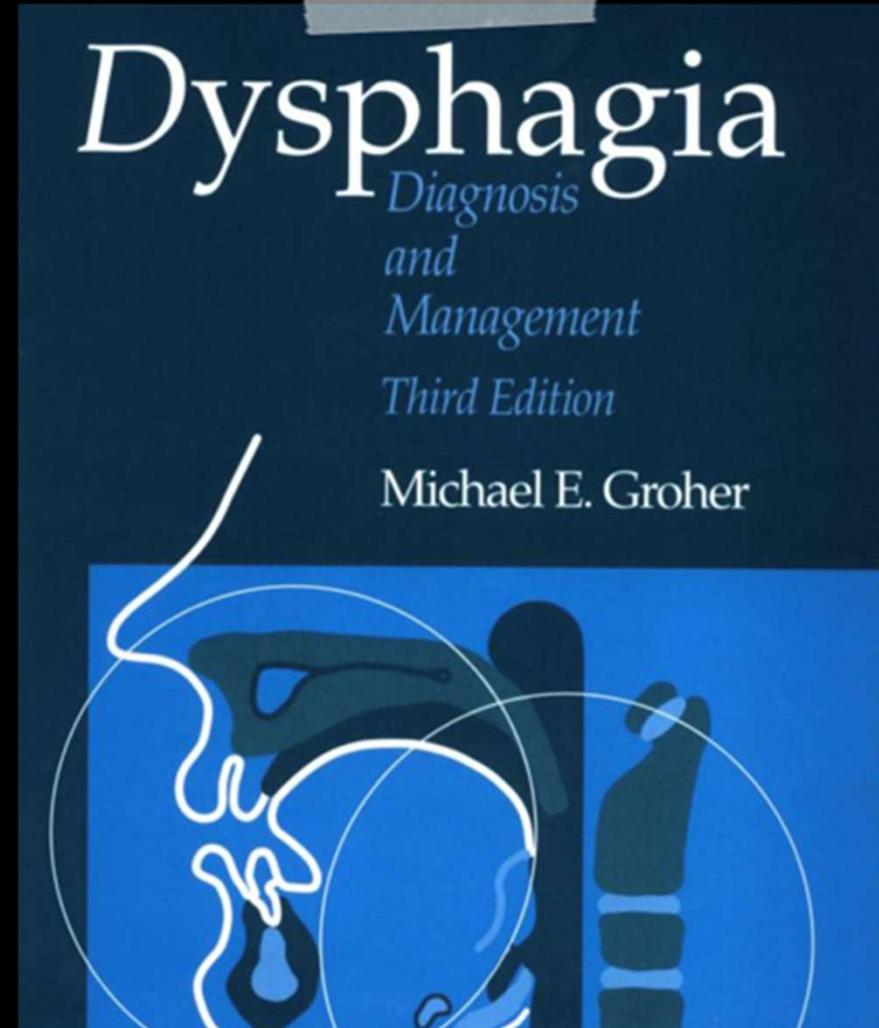
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M. Groher 1997

- ist ein Patient nicht in der Lage das Entcuffen zu tolerieren, wird er wahrscheinlich auch nicht oralisierbar sein
- Reaktion des Körpers auf Penetration und Aspiration bei gecuffter TK nicht effektiv sein
- Aspirationen werden bei gecuffter TK nicht unmittelbar erkannt, was zu verzögertem Absaugen führen kann

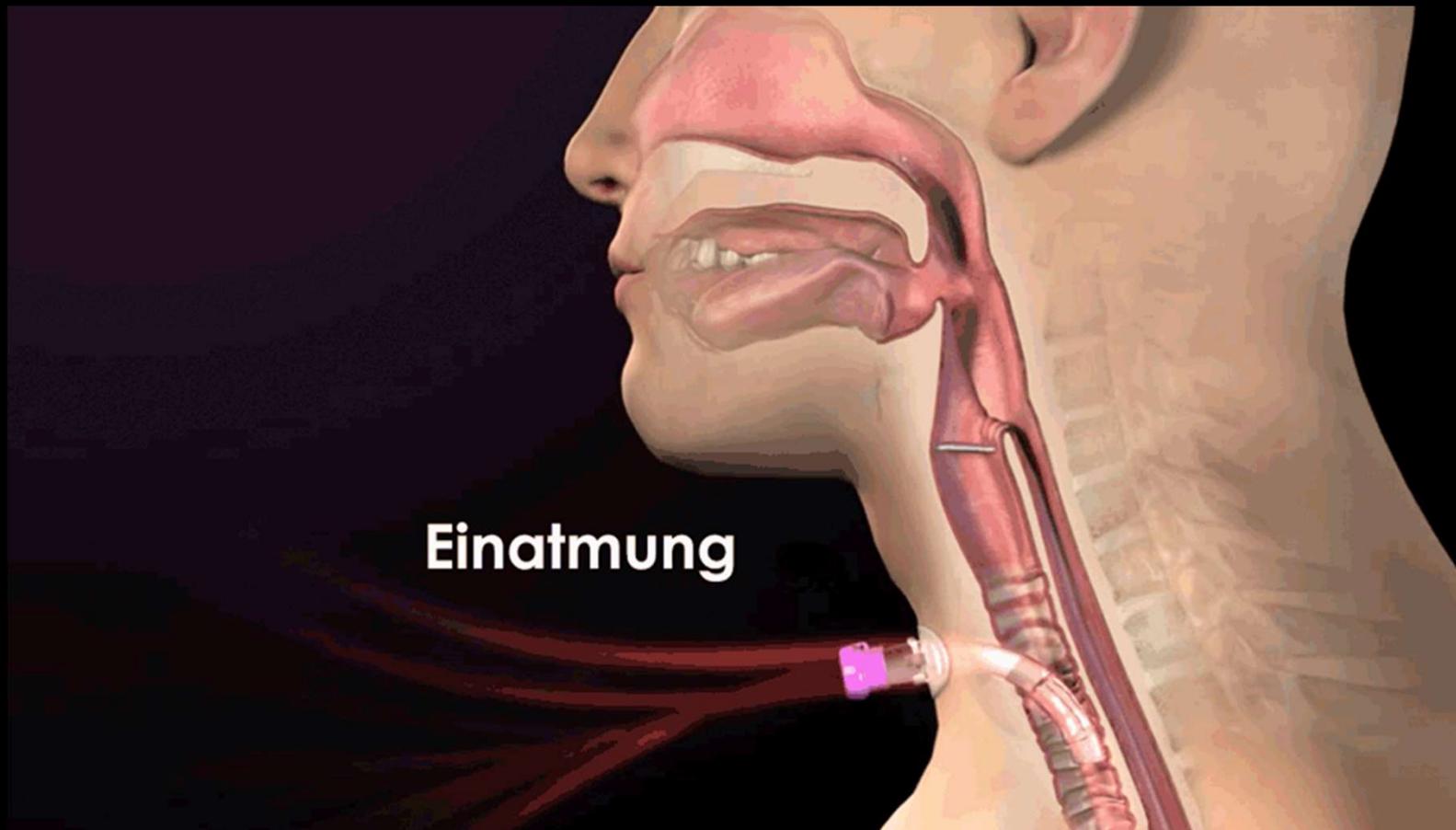


Schluckreflex

Use it, or lose it.

Schutzreflex

Use it, or lose it!



die Lösung:

Luft aus dem Cuff entfernen und Ventil nutzen.

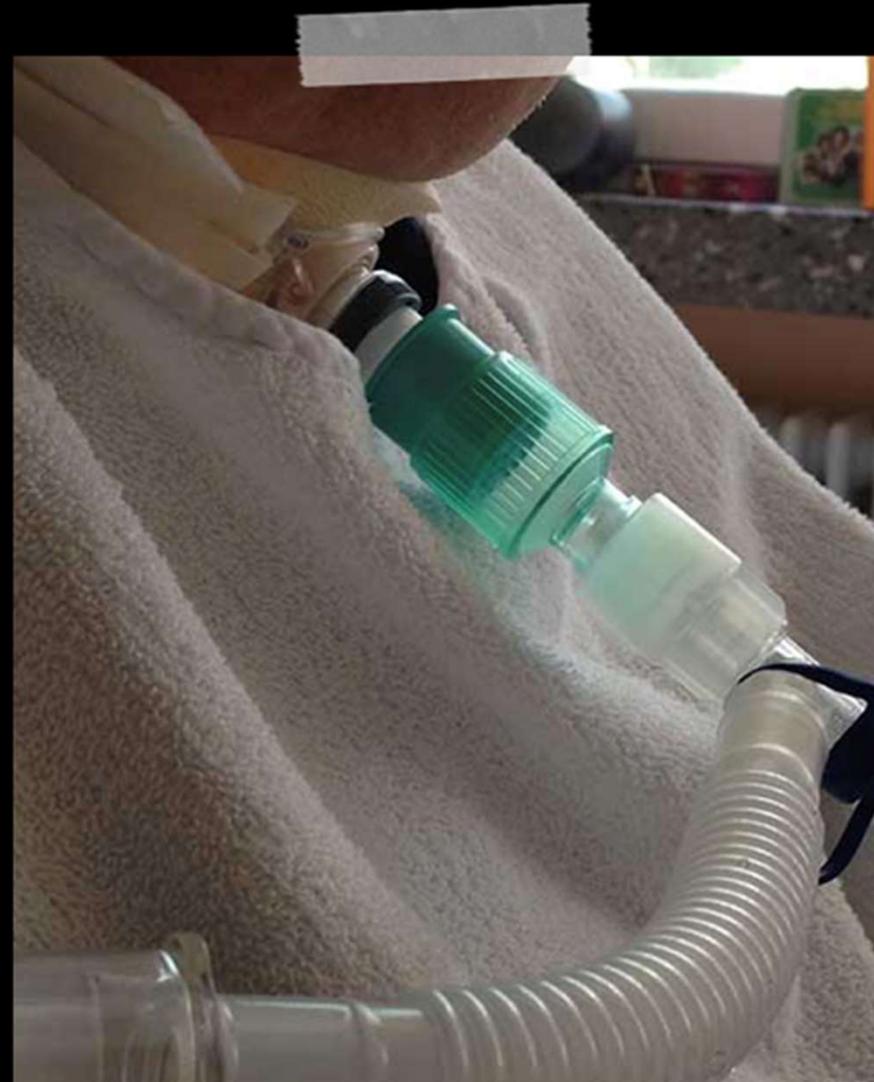
~~Sprech~~ Schluckventil

- TK entcuffen
- verschließt TK bei Ausatmung
- öffnet bei Einatmung
- Luftstrom durch Larynx und Pharynx für das
 - Schlucken
 - Sprechen



auch bei Beatmung?

- Sprech- & Schluckventil für beatmete Patienten
- erhöhter Druck in Trachea und Leckage senken Aspirationsrisiko
- Luftstrom durch Larynx und Pharynx für das
 - Schlucken
 - Sprechen

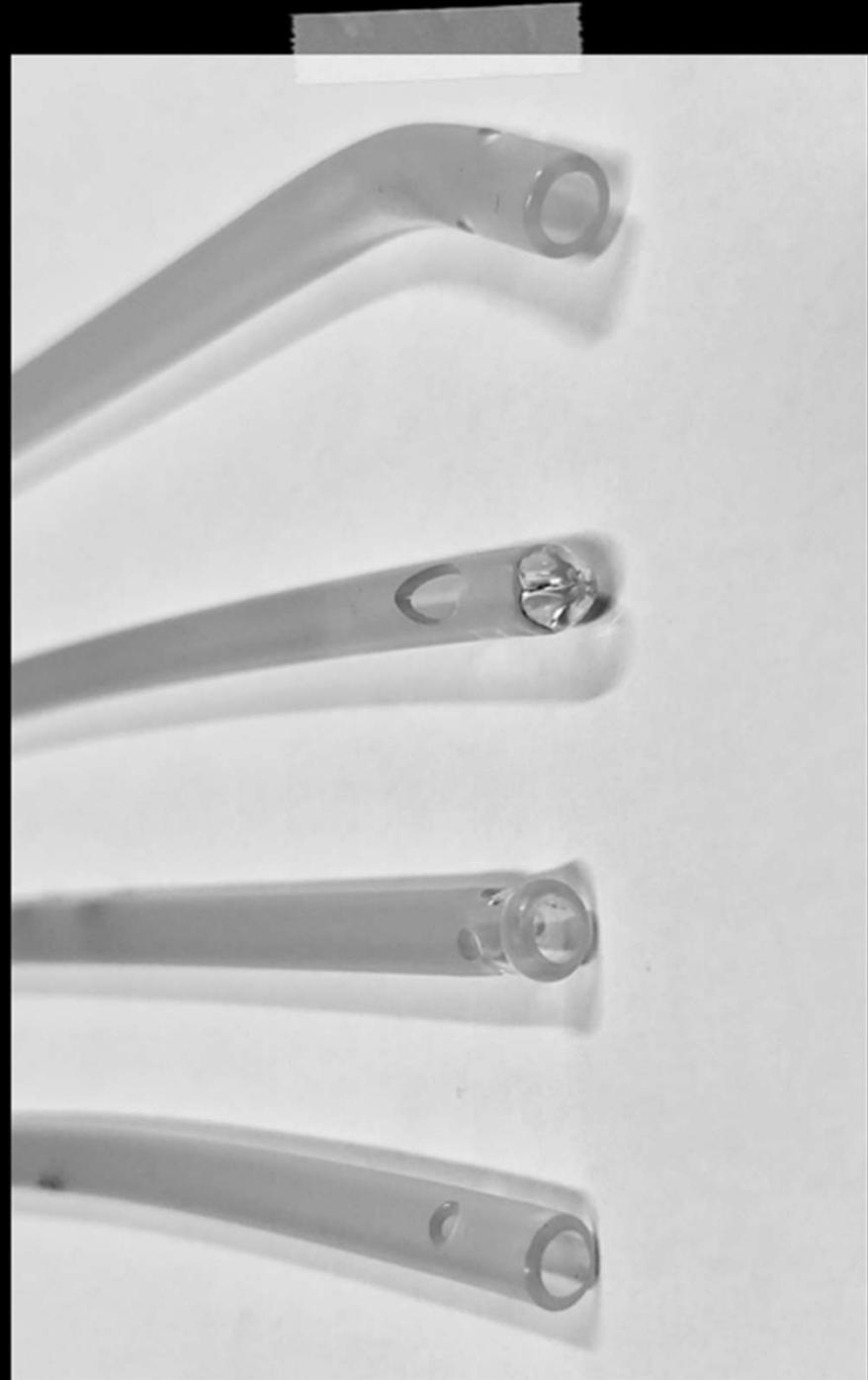


Entcuffen? Absaugen?

Absaugen

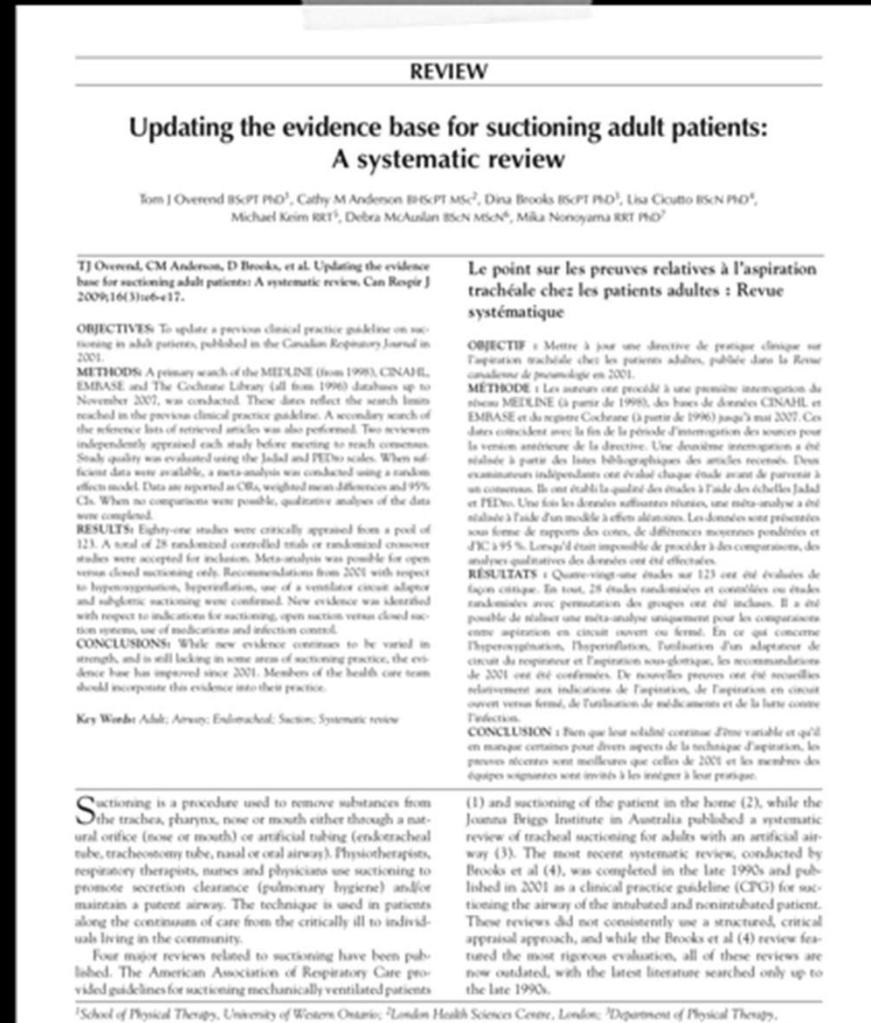
Ein Reinigungsvorgang
der manchmal nötig ist.

Regelmäßiges
Absaugen?



Absaugen

- offene und geschlossene System unterscheiden sich nicht in Bezug auf den Einfluss auf das Lungenvolumen
- bei transoraler Intubation ist min. 1x/4 h als Absaugfrequenz Konsens
- keine Empfehlung bei endotrachealem Absaugen
- tiefes Absaugen erhöht die Sekretproduktion in den Atemwegen
- schlechte Studienlage zur Suction Aid



Lee N. Pryor et. al. 2016

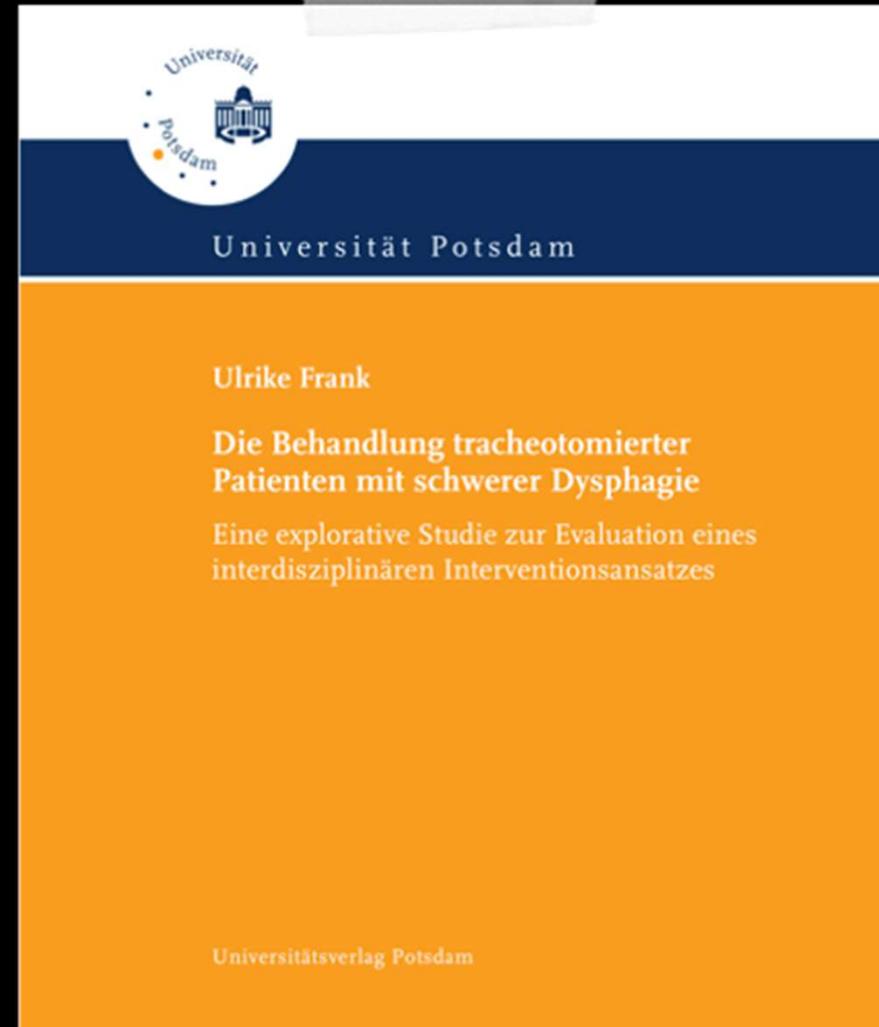
Schlüsselfaktoren für erfolgreiches Entcuffen:

- Färbung und Beschaffenheit des Sekrets
- Häufigkeit des Absaugens
- Faktor Mensch
- medizinische Situation



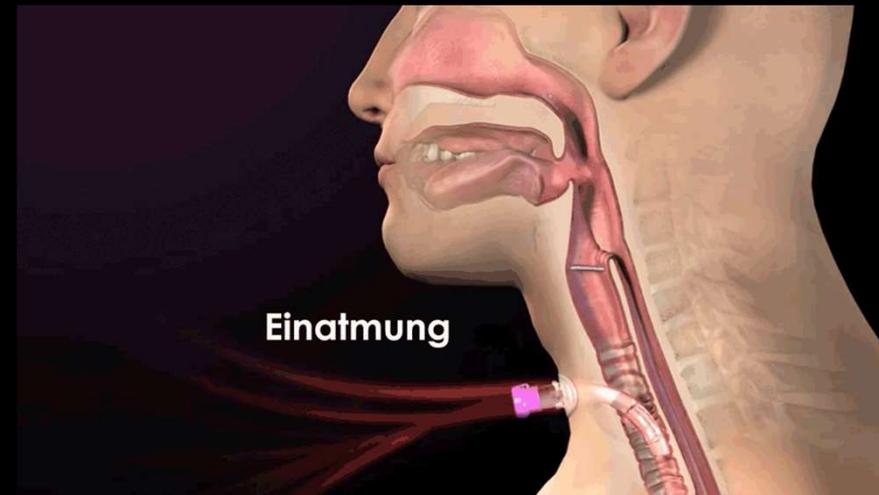
U. Frank 2008

- übersichtliche Arbeit mit zusammenfassendem Charakter
- ausgewogene Diskussion unterschiedlicher Strömungen



Entcuffen & Ventil

- positiver Effekt auf das Schlucken
- positiver Effekt auf Schutzmechanismen
- positiver Effekt auf die Phonation
- QoL!



Take home

- Absaugen als Prozedur bei Bedarf.
- Häufiges Absaugen begünstigt Sekretbildung.
- Sprechventile sind Schluckventile.
- Auf entcuffter Trachealkanüle ermöglichen Schluckventile Schutzmechanismen.
- Mehr „Hirn“ bei der Versorgung und weniger „Standards“.



Danke

für Ihre Aufmerksamkeit