

**Title:**

Preliminary results of the Incidence, Predictors, and Recovery of Post-Extubation Dysphagia in Critically Ill Patients

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**Abstract**

**Introduction/Background:** The Intensive Care Unit (ICU) at Hôpital Montfort has seen an increase in patients requiring prolonged endotracheal intubation ( $\geq 48$  hours), a known risk factor for post-extubation dysphagia, aspiration, and associated complications. While the literature has sought to determine factors associated with post-extubation dysphagia, there is a paucity of literature demonstrating its incidence (3% to 63%), timing and resolution. This clinical uncertainty results in prolonged duration of non-oral intake (NPO), and incorrect dietary prescriptions resulting in aspirations or inadequate intake. In order to address care gaps and improve clinical practice, an interdisciplinary team consisting of medicine, speech-language pathology (SLP), pharmacy, and nursing, has undertaken a longitudinal project with the aim to complete, collect, and review the results of all swallowing assessments post intubation to identify dysphagia.

**Objectives:** Our main objective was to identify the incidence of dysphagia after prolonged endotracheal intubation. Secondary objectives were to determine (1) Predictors of post-extubation dysphagia; (2) duration of dysphagia (3) predictors of recovery and (4) time to recovery.

**Methods:** This is an ongoing quality improvement, combined retrospective and prospective cohort study of patients with prolonged endotracheal intubation at Hôpital Montfort between July 2017 to December 2018. One hundred and ninety-two patient medical charts were reviewed. Data extracted by a trained medical student included medical history and demographic variables, lengths of stay, ICU readmissions, death, results of SLP assessments and their follow-ups. SLP follow-ups of patients post-ICU discharge were used to assess the incidence of recovery from post-extubation dysphagia as well as time from extubation to recovery. Basic descriptive and frequency statistics were computed for all primary and secondary outcome variables. Associations were determined using T-tests, Mann-Whitney U tests, and chi-square tests to examine possible differences between outcome variables. The incidence rate of dysphagia was expressed as the number of patients with dysphagia over the total number of patients intubated for longer than 48 hours. The risk factors (predictors) of dysphagia were examined using binary logistic regression analysis, presented as Odds Ratios (OR) with

95% Confidence Intervals (CI). Ethics approval was obtained from Hôpital Montfort Research Ethics Board.

**Results:** Preliminary results indicate that our population was 56.3% male, a mean age of 64 years old, hospital length of stay of 21.8 days, ICU length of stay of 12.1 days, a total of 62.5% had an SLP follow-up, and 34.4% died. The prevalence of post-extubation dysphagia was 47.9% with a recovery rate of 82% as per SLP assessment. Using binary logistic regression only baseline functional status was found to predict dysphagia with an odds ratio (OR) of 1.48; 95% CI (2.07-9.39) P=.000.

**Conclusion:** The incidence of dysphagia after prolonged endotracheal intubation of 47.9% found in our study is similar to published results for those who undergo proper assessment by a trained speech language pathologist. We also found a recovery rate of 82% in those who had dysphagia, excluding deaths. Based on these findings, all patients intubated for longer than 48 hours should be assessed prior to initiation or oral intake by a trained SLP practitioner.

### References:

1. Skoretz SA, Flowers HL, Martino R. The incidence of dysphagia following endotracheal intubation: a systematic review. *Chest*. 2010;137(3):665–73.
2. Colice GL, Stukel TA, Dain B. Laryngeal complications of prolonged intubation. *Chest*. 1989;96(4):877–84.
3. Kim MJ, Park YH, Park YS, Song YH. Associations between prolonged intubation and developing post-extubation dysphagia and aspiration pneumonia in non-neurologic critically ill patients. *Ann Rehabil Med*. 2015;39(5):763–71.
4. Macht M, King CJ, Wimbish T, Clark BJ, Benson AB, Burnham EL, Williams A, Moss M. Post-extubation dysphagia is associated with longer hospitalization in survivors of critical illness with neurologic impairment. *Crit Care*. 2013;17(3):R119.
5. Macht M, Wimbish T, Bodine C, Moss M. ICU-acquired swallowing disorders. *Crit Care Med*. 2013;41(10):2396–405.
6. Macht M, Wimbish T, Clark BJ, Benson AB, Burnham EL, Williams A, Moss M. Post-extubation dysphagia is persistent and associated with poor outcomes in survivors of critical illness. *Crit Care*. 2011;15(5):R231.
7. Barker J, Martino R, Reichardt B, Hickey EJ, Ralph-Edwards A. Incidence and impact of dysphagia in patients receiving prolonged endotracheal intubation after cardiac surgery. *Can J Surg*. 2009;52(2):119–24.