

Patient-Centered Outcomes after ICU Tracheostomy: A Historic Cohort Study

INTRODUCTION

Critically ill patients who require prolonged mechanical ventilation or additional assistance with secretion management frequently undergo tracheostomy in the intensive care unit. Decisions to proceed with a tracheostomy are based on the clinician's experience and balancing the risks versus benefits in a shared decision-making process with the patient or surrogate decision maker.

While the association of tracheostomy with duration of mechanical ventilation and 28-day mortality has been previously studied, there is limited research on long-term, patient-centered outcomes which may help inform the decision to proceed with this procedure¹. Patients and surrogate decision makers often lack information regarding prognosis and functional recovery, which can result in patients receiving treatment that is not aligned with their goals of care²⁻⁴. Presented with real world outcome data, patients or their surrogate decision makers may prefer to forego tracheostomy⁴.

OBJECTIVES

The goal of this study was to evaluate the hospital and long-term mortality, as well as the incidence of new institutionalization after discharge among patients who underwent a tracheostomy in the Intensive Care Unit.

METHOD

STUDY DESIGN

- Our historic cohort study was conducted at the Jewish General Hospital, a tertiary care center affiliated with McGill University in Montreal, Canada.
- A cohort of patients who underwent tracheostomy in the ICU from 2011 to 2022 was established.

DATA COLLECTION

- The charts of included patients were reviewed and abstracted for demographic and clinical data.
- These included age, sex, comorbidities, mortality, duration of ventilation pre- and post-tracheostomy, time to decannulation, ICU and hospital length of stay, and patient discharge location.
- Cohort patients were classified by tracheostomy indication: **secretion management** or **prolonged ventilation**.

OUTCOMES

- The **primary outcome** was **hospital mortality**.
- Secondary outcomes included ICU mortality, 1- and 3-year mortality, and new institutionalization (ie: unable to return to previous living arrangements).

STATISTICAL ANALYSIS

- Descriptive and comparative analyses were performed using chi-square analysis for categorical variables and Wilcoxon Rank Sum test for continuous variables.
- In a prespecified analysis, all outcomes were compared between tracheostomy indication groups.
- All analyses were pre-specified and conducted at an alpha of 0.05.

AUTHORS

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RESULTS

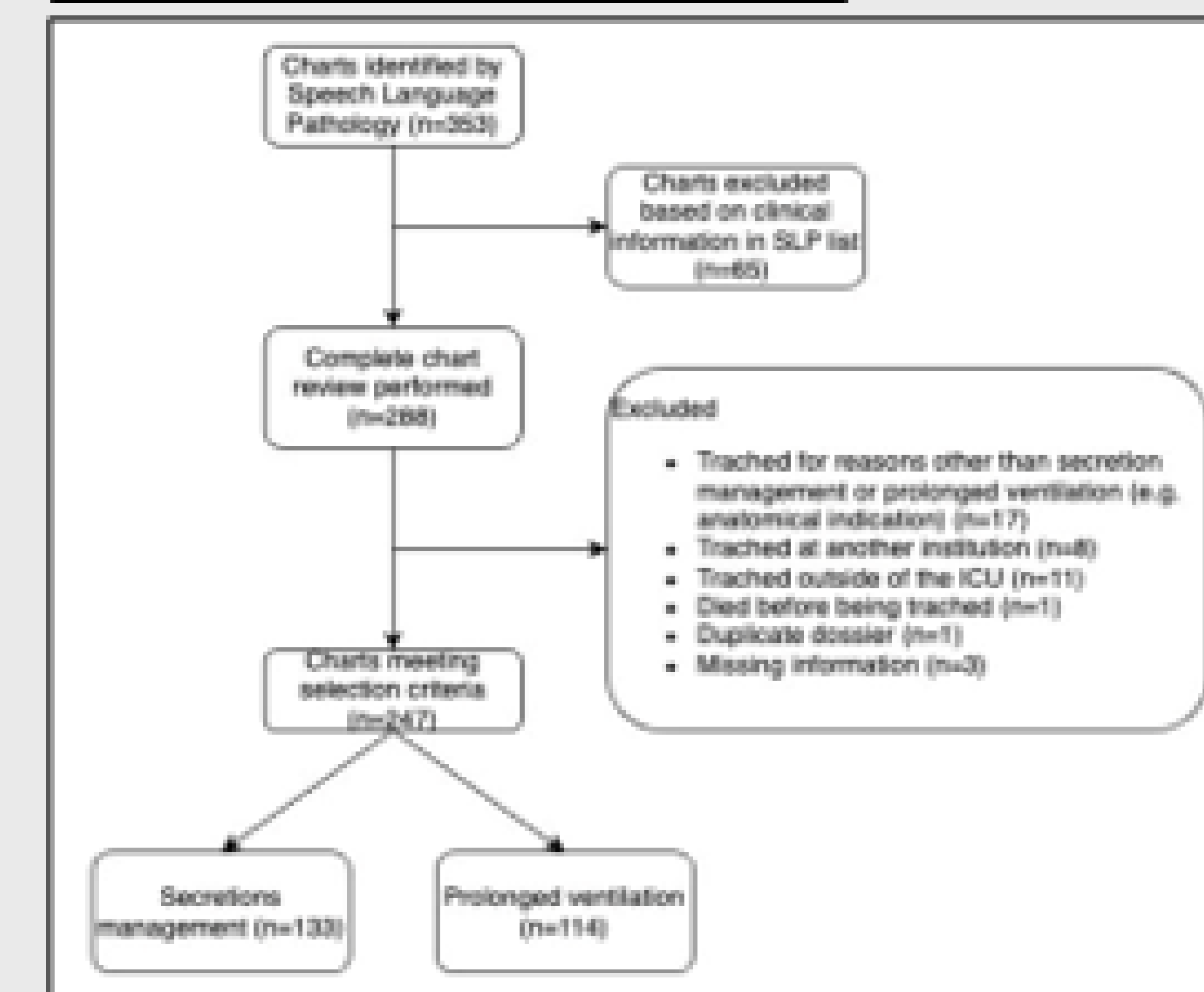
PRIMARY OUTCOME

- Overall hospital mortality was 86/247 (34.8%) which is comparable with previous reports⁵.
- There was no significant difference between secretion management (32.7%) and prolonged ventilation (37.7%) [p=0.37].

SECONDARY OUTCOMES

- The **prolonged ventilation** group had a significantly **higher ICU mortality**.
- Over one third** of patients who survived to hospital discharge required **new institutionalization**.
- Significantly more patients in the **secretion management** group required **relocation**.

Figure 1: Flow diagram for patient inclusion and exclusion



	All (n=247)	Secretion Management (n=133)	Prolonged Intubation (n=114)	p-value
ICU mortality	47 (19%)	13 (10%)	34 (30%)	< 0.001
28-day mortality	34 (14%)	15 (11%)	19 (17%)	0.22
1-year mortality* (n=207)	106 (51%)	51 (48%)	55 (54%)	0.33
3-year mortality* (n=167)	117 (70%)	59 (71%)	58 (69%)	0.88
New institutionalization** (n=139)	49 (36%)	37 (47%)	12 (20%)	0.001
Duration of ventilation				
Prior to trach (days), median, [IQR]	19 [14 – 26]	17 [12 – 24]	21 [15 – 29]	< 0.001
After trach (days), median, [IQR]	12 [4 – 31]	6 [1 – 14]	23.5 [13 – 41]	< 0.001
Length of stay				
ICU (days), median, [IQR]	41 [26 – 63]	31 [21 – 55]	51.5 [26 – 63]	< 0.001
Hospital (days), median, [IQR]	85 [56 – 136]	97 [62 – 155]	76 [50 – 124]	0.0022

* Patients lost to follow-up

** Patients died (n=66) and lost to follow-up

CONCLUSION

- We explored the long-term functional outcomes after ICU tracheostomy and demonstrated a **significant incidence of new institutionalization**.
- We found that **indication for tracheostomy** was associated with both **short- and long-term patient outcomes**.
- These findings may be important for families and decision makers to consider prior to deciding to undergo a tracheostomy.
- The incidence of new institutionalization should be prospectively explored in future studies of critical care tracheostomy as an important **patient centered outcome**.

ACKNOWLEDGEMENTS

Special thanks to Supervisor Dr. Blair Schwartz and Dr. Paul Warshawsky, Dr. Linda Zhu and Milana Schipper.

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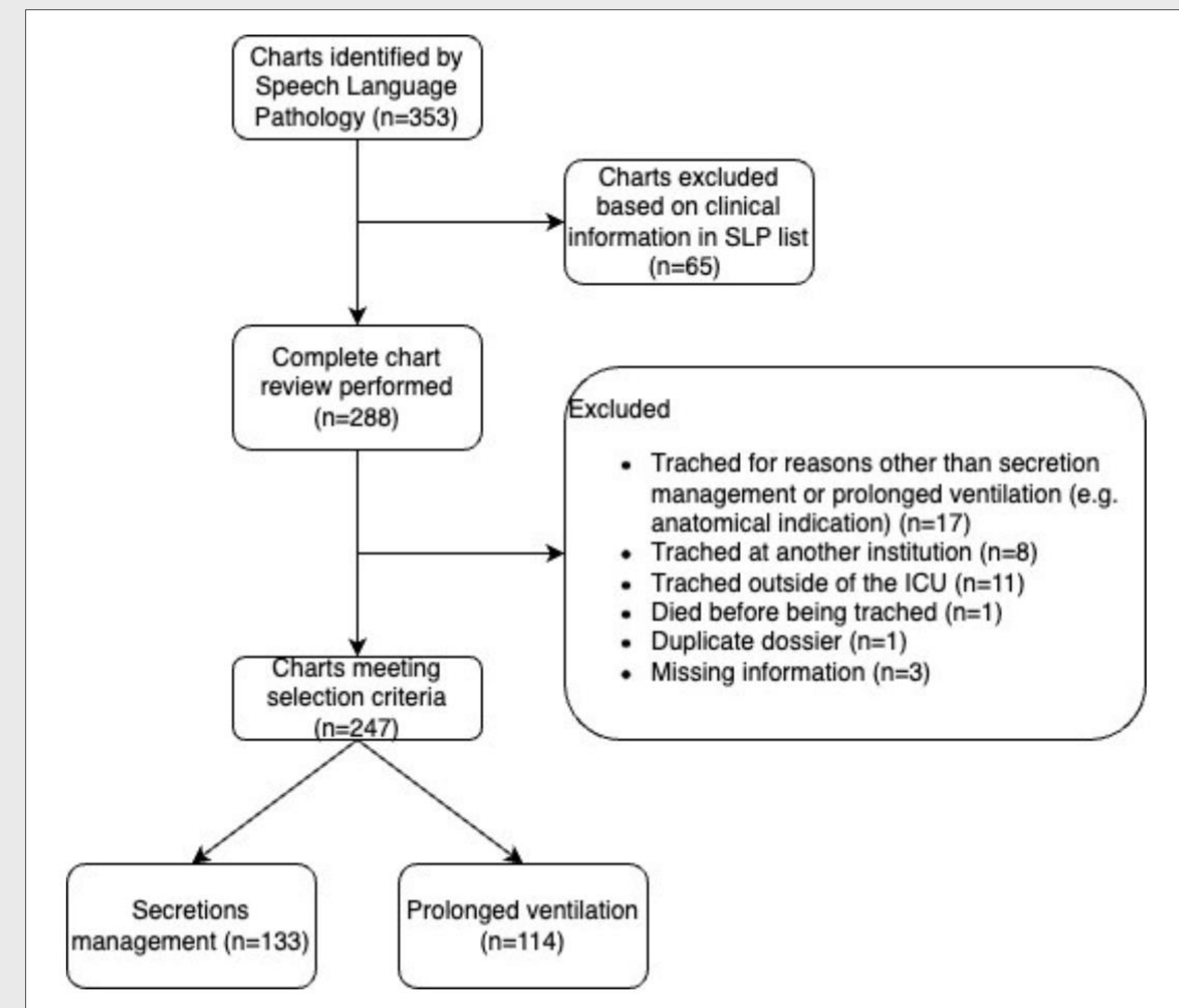
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