SRTP - Project Description Form #250

PART I:

Name of Schulich faculty member who will supervise the project	Adrian Mendez
Supervisor's Schulich, Western, Hospital or Lawson Email	Adrian.Mendez@lhsc.on.ca
Schulich Department	Otolaryngology – Head and Neck Surgery

PART II - Project Description

Title of Project	Complication Rates of Intensive Care Unit Percutaneous Dilatational Tracheostomy versus Open Surgical Tracheostomy – A Retrospective Chart Review

Background

The most common indications for a tracheostomy include upper respiratory tract obstruction, weaning from prolonged ventilation, facilitating mechanical ventilation, aspiration risk and impaired pulmonary toileting. Prior to the introduction of percutaneous dilatational tracheostomy (PDT), surgical tracheostomy (ST) was the primary procedure utilized to treat upper airway obstruction. In contrast to ST, which involves tracheal wall incision and dissection before directly visualized cannula insertion, PDT utilizes blunt dissection and tracheal dilatation over a guidewire prior to insertion. Additionally, ST can only be performed by a trained surgeon, most commonly an ENT specialist, whereas PDT is a simpler procedure that can be performed by intensivists. Currently, PDT is the predominant tracheostomy procedure in the intensive care unit (ICU) and has resulted in a decrease in ICU ST. Benefits of PDT include the ability to operate at the bedside, reduced resource utilization and lower training requirements. However, complex anatomical cases and patients with contraindications for PDT require surgical evaluation and ST. As surgeons performing ST routinely book postoperative follow-up appointments, the relative decrease in ST raises potential concern for inferior longitudinal care. Currently, there are a limited number of studies evaluating individual case features of PDT versus ST in patients. In particular, there is a gap in the literature concerning long-term outcomes and patient follow-up for PDT versus ST.

Hypothesis

The primary objective of this study is to compare long-term outcomes and patient follow-up data between patients who underwent PDT and those who underwent ST at a tertiary hospital in Ontario, Canada. The secondary objective is to compare individual case features and major and minor complication rates between patients who underwent PDT versus ST.

It is hypothesized that patients in the ST group will have better long-term outcomes and better patient-follow up. It is also hypothesized that complication rates will be lower in the ST group.

Proposed Methodology

A retrospective chart review of patients from January 1, 2010 to December 31, 2022 will be conducted. Relevant clinical variables will be extracted from patient electronic medical records and recorded in RedCap to ensure secure collection, analysis and storage of deidentified data. All patients aged ≥18 years who have received a tracheostomy will be included. Patients that do not meet these criteria or had PDT contraindications prior to tracheostomy will be excluded from the review. Deidentified data will be analyzed and presented as mean (± standard deviation), median, interquartile range, or number (%) based on data distribution. Comparisons between clinical variables will be performed using Student's T-test for parametric continuous variables and U Mann-Whitney or Kruskal-Wallis test for

non-parametric data. Categorical variables will be compared using Chi-squared or Fisher's exact tests.

Expected Outcomes
Long-term outcomes and patient follow-up data for PDT versus ST have been analyzed for statistical differences. Preliminary results indicate that there is a statistically significant difference in major complications between the two groups, with PDT having a larger rate. Additionally, long term follow-up was found to be superior in the ST group.

As more results are gathered, these trends are expected to continue. More detailed information regarding specific outcomes will be elucidated.

Research Environment – Description of the number of research personnel, primary location of research, size of lab, etc
Research personnel include:
- Ram Patel (myself; Second Year Schulich Medical Student, Western University, Windsor Campus)
- Dr. Adrian Mendez (PI; Head and Neck Surgeon at Victoria Hospital, Western University, London, ON)
- Halema Khan (Research Coordinator, Head and Neck Surgery, Western University, London ON)
- Dr. Karan Gandhi (Head and Neck Surgical Resident, Western University, London, ON)

Primary location of research: London Health Sciences Centre (Victoria Hospital), London, ON

Size of Lab: Currently 4 research personnel on the core team, but collaboration will occur with the entire otolaryngology department and intensivists at London Health Sciences Centre

Names and titles of other individuals who will be involved with the research project?
Other London Health Sciences Centre otolaryngology attending physicians and residents may be involved in the project at a later stage. In addition, London Health Sciences Centre intensivists may be involved at a later stage.

Can this project be done remotely?	Yes
Duration of Project	One Summer

Expected Objectives/Accomplishments for Student?
Conference Presentation and Manuscript Publication

PART III - Certifications

If the project will require any certification approvals from one or more of the following offices, please check the appropriate box below.	- Human Ethics
Human Ethics: If you have the protocol information, please enter it below (or enter the status of the approval).	Western REB and Lawson REB approval has already been approved. The PROJECT ID is: 123735

Note: certification approval should be obtained prior to the start of the summer. Projects without this approval will not be a priority for funding.