The Global Tracheostomy Collaborative: One Institution's Experience with a New Quality Improvement Initiative

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ABSTRACT

Purpose: Given the relatively low frequency of adverse events after tracheostomy, individual institutions may struggle to collect enough objective outcomes data to generate effective quality improvement protocols. The Global Tracheostomy Collaborative (GTC) is a multi-institutional, multidisciplinary organization whose aim is to improve the care and safety of tracheostomy patients. The GTC utilizes a prospective database to gather data on patients undergoing tracheostomy. We describe our institution's preliminary experience with this new record.

Methods: Demographic and outcome data on children undergoing tracheostomy at our institution from January 2013 to September 2014 were entered into the GTC database, a database collected and managed by REDCap (Research Electronic Data Capture). Tracked outcomes included the adverse events of accidental decannulation, failed decannulation, tracheostomy tube obstruction, bleeding/trachea-innominate fistula, and tracheocutaneous fistula.

Results: Data from 60 patients undergoing tracheostomy between January, 2013 and December 2014 at our institution were recorded. The most common indication for surgery was facilitation of ventilation in 49/60 patients. Average time from admission to tracheostomy was 64.6 days (range 0-208). The only short-term complication was a stomal breakdown in 1 patient. Forty-eight patients have been tracked to hospital discharge with 43/48 patients surviving. None of the mortalities were secondary to accidental decannulation, tracheostomy tube obstruction or hemorrhage. 47.9% of patients were discharged to a rehabilitation hospital, 35.4% to home, 8.3% to a long term care facility, and 6.3% to another acute care hospital.

Conclusion: The Global Tracheostomy Collaborative is a multi-institutional and multidisciplinary collaborative that collects data on patients undergoing tracheostomy. Our experience proves the feasibility of entering demographics and outcome data into the GTC database. With respect to short-term complications, tracheostomy was found to be a safe procedure. As other institutions follow suit, the GTC database may prove to be a valuable resource for generating quality and safety improvement protocols for tracheostomy.

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INTRODUCTION

Tracheostomy is a relatively straightforward surgical procedure that results in the need for complex and labor intensive post-operative care. Patients who undergo tracheostomy are typically medically complex, and care of the tracheostomy itself is often only one part of a very detailed medical care plan carried out by numerous teams. Adverse events related to tracheostomy are relatively uncommon, and individual institutions may not have sufficient case numbers to generate meaningful data regarding safety events and ways to improve patient outcomes.

The Global Tracheostomy Collaborative (GTC) aims to improve the care and safety of tracheostomy patients, in part by utilizing a prospective multi-institutional database to gather data on patients undergoing tracheostomy. We describe our institution's early experience with this new tool.
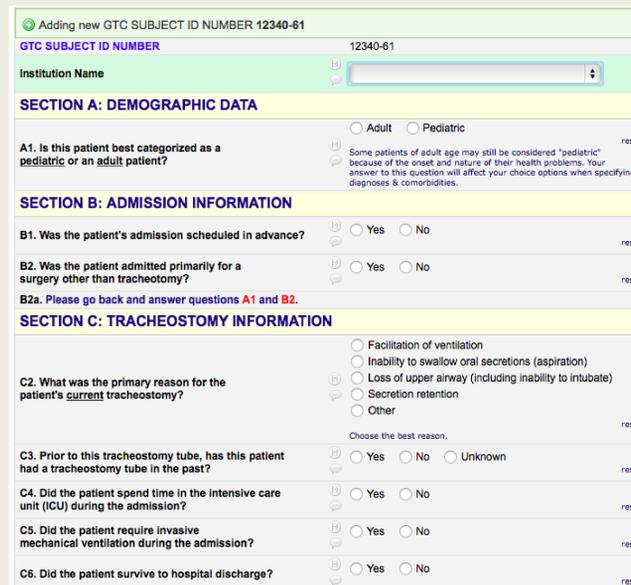
METHODS

The GTC uses a prospective database that collects and manages data using REDCap electronic data capture tools hosted at each host institution. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for studies, providing 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources.[1]

The database is focused on the hospital admission during which tracheostomy was performed, and includes fields for all pertinent demographic information, reason for hospitalization, comorbidities, and indication for tracheostomy. Outcomes data include fields for complications such as tracheostomy tube obstruction, accidental decannulation, tracheostomy bleeding, stomal breakdown, and need for revision.
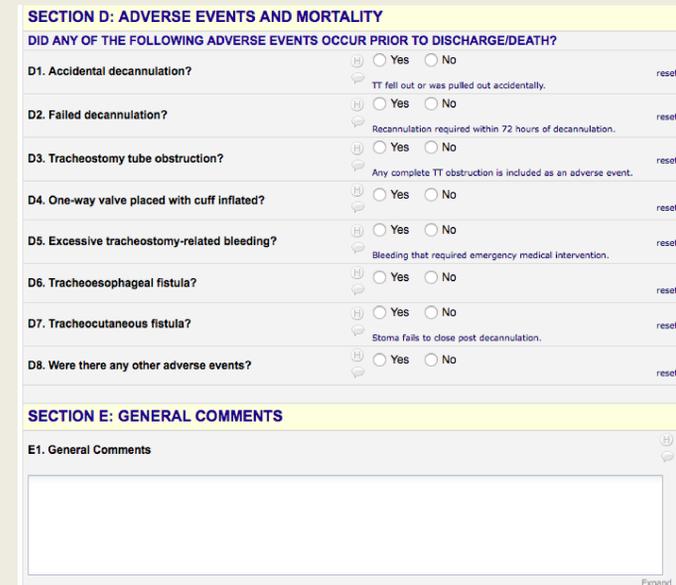
Data on children undergoing tracheostomy at Children's National Medical Center in Washington, DC from January 1, 2013 to December 31, 2014 were recorded into the GTC database. All information was entered by pediatric otolaryngology fellows or a skilled tracheostomy nurse to ensure that data were accurate.

RESULTS

- Total data entry time for each patient was less than 5 minutes.
- Data from 60 patients undergoing tracheostomy was recorded into the GTC database during this period.
- Medical comorbidities were common in this patient population. Respiratory comorbidities were found in 34/60 patients (56.67%), cardiac comorbidities in 21/60 patients (35%), and neurological comorbidities in 16 patients (26.7%).
- The most common primary indication for tracheostomy placement was respiratory failure in 49/60 patients (81.6%). Chronic aspiration and upper airway obstruction (including obstructive sleep apnea) were the primary indication in 6/60 (10%) and 5/60 (8.3%) of patients respectively.
- Average time from date of admission to date of tracheostomy was 64.6 days (range 0-208 days).
- There were no accidental decannulations, failed recannulations, tracheostomy tube obstructions, bleeding/tracheoinnominate fistulas, or tracheocutaneous fistulas in this patient population. One patient had minor wound breakdown on the inferior aspect of the tracheostomy stoma.
- To date 48/60 patients (80.0%) were survived until hospital discharge. Of these patients, 23 (47.9%) were discharged to a rehabilitation hospital, 17 (35.4%) went home, 3 were transferred to another acute care hospital (6.3%), and 4 (8.33%) were transferred to a long term care facility. Five patients (8.3%) died prior to hospital discharge, however none of the patients died directly from tracheostomy related complications.

CONCLUSION

- Preliminary results from our institutions two year experience with this quality improvement tool have confirmed the findings supported by other studies that tracheostomy related complications are rare, and that post-tracheostomy mortality is rarely directly due to tracheostomy related complications.[2,3]
- As more institutions participate, larger powered studies will be possible that would permit further characterization of quality issues in tracheostomy patients.
- It is through the collaborative reporting of data that the GTC database has the potential to make a meaningful contribution to quality initiatives.

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