



Background

Laryngotracheal Stenosis (LTS) is a narrowing of the airway, often due to birth defects or the growth of inflamed tissue. If left untreated, it can lead to respiratory arrest or the patient requiring a permanent tracheostomy tube.

LTS occurs in **1 in 65,400** live births¹, and if left untreated, the mortality rate of congenital LTS can be as high as **70%**²

Up to 30% of people who are intubated will develop LTS.³



Each patient's tracheal geometry is unique, so there is **no one-size-fits-all approach** for treating LTS.

Treatment decisions, such as which procedure(s) to perform and how often, are made based on **location and severity** of the stenosed region. Current methods of assessment do not provide accurate, quantitative information on these metrics.

References

- 1. EL-Andari R, Zibdawi R, Holinski P, et al. Congenital tracheal stenosis patients undergoing modified slide tracheoplasty: single-centre technique and long-term morbidity and mortality. CJC Pediatric and
- *Congenital Heart Disease*. 2023;3(1):24. doi:10.1016/j.cjcpc.2023.10.003
- 2.Yi SD, Kim SO, Kim CS, Kim SD. Two cases of congenital tracheal stenosis noticed before and after open heart surgery. Korean J Anesthesiol. 1995;28(5):716. doi:10.4097/kjae.1995.28.5.716 3. Zias N, Chroneou A, Tabba MK, et al. Post tracheostomy and post intubation tracheal stenosis: report of 31 cases and review of the literature. BMC Pulm Med. 2008;8:18. Published 2008 Sep 21. doi:10.1186/1471-2466-8-18

Trackea: 3D Pediatric Trachea Reconstruction Technology

Aiesha Chaudhry, Milun Jain, Ana Todesco, Shawn Wang, Anjali Vinodh, Bianca Bearare, Nnemdi Amanambu **Clinical Mentors:** Sarek Shen, MD, MS, Jonathan Walsh, MD (Department of Otolaryngology—Head and Neck Surgery, Johns Hopkins Hospital) Faculty Mentor: Elizabeth Logsdon, PhD **TA:** Sabine Meurs



Stenosed



Need

Pediatric otolaryngologists need to **monitor the geometry** of a patient's laryngotracheal stenosis over time in order to determine the most effective management strategy.

Solution

Trackea provides otolaryngologists with a complete 3D visualization of the trachea with **quantitative** information on tracheal geometry, allowing them to easily identify stenosed areas and determine their severity.

Needs Addressed:

• Quantifies the depth, length, and cross-sectional area of the stenosed region

Impact



• Integrates into current surgical workflow

• Displays interactive model to clinicians

• Compares data from each stage of treatment



Help clinicians determine best treatment options



data on a patient's condition





various LTS

treatments