

Cover Page

**Proof of Concept Clinical Decision Support Tool for Chronic Rhinosinusitis
Assists Providers in Guiding Patients Considering Endoscopic Sinus Surgery**

Sameer Andani, Katy E Trinkley, PharmD, PhD², Vijay R Ramakrishnan¹, MD

- 1- Department of Otolaryngology, University of Colorado, Aurora, Colorado, U.S.A.
- 2- Clinical Informatics, University of Colorado Anschutz Medical Campus, Aurora, CO, United States,

- Declarations for each author:
- Sameer Andani
 - No financial support
 - No Conflicts of interest
 - Contributorship: Primary investigator. Wrote draft paper, developed posters, developed figures
- Katy E Trinkley
 - No financial support
 - No Conflicts of interest
 - Contributorship: Consulted on best practices for tool design, reviewed posters, contributed to study design
- Vijay R Ramakrishnan
 - No financial support
 - No Conflicts of interest
 - Contributorship: Consulted on best practices for tool design, reviewed posters, reviewed draft papers, substantially contributed to study design, recruited survey respondents.

This manuscript does not report on a clinical trial

Abstract

BACKGROUND

Chronic Rhinosinusitis (CRS) is an inflammatory condition of the paranasal sinuses which is defined by conditions that last greater than 12 weeks despite treatment. If treatments such as antibiotics fail, endoscopic sinus surgery is recommended.

Discussing the risks and benefits of surgery requires patient understanding, risk to benefit presentation, and shared decision making between the patient and physician.

This study examines the efficacy of a web-based clinical decision support to aid patients considering surgical intervention for chronic rhinosinusitis.

METHODS

A web based clinical decision support tool was creating using R- Shiny apps. The tool uses a mock random-forest based machine learning algorithm with SNOT-22 score as the outcome metric. Surveying of the tool's utility was conducted using the System Usability Scale, Likert based survey questions used in previous clinical decision support tool creations, and optional free-text input for additional comments.

RESULTS

Rhinologists across the nation who perform endoscopic sinus surgeries were surveyed to gauge efficacy of the tool. A total of 9 rhinologists responded to the survey. Survey data indicated that 8/9 participants agreed that they would use the

tool frequently, 9/9 thought the tool was easy to use, and 5/9 agreed that the tool would improve clinical decision making and patient care.

CONCLUSION

In conclusion, the web-based clinical decision support tool created in this study was found to be easy to use and effective in improving clinical decision making and patient care for patients considering surgical intervention for chronic rhinosinusitis. The tool was also well-received by rhinologists, with 8/9 participants agreeing that they would use the tool frequently and 9/9 agreeing that the tool was easy to use. These findings suggest that the tool has the potential to be a valuable tool for rhinologists and patients in making informed decisions about CRS treatment. However, further optimization of the backend algorithms that power the tool should be incorporated when available.