



PROGRAM BOOK

ARS 72nd Annual Meeting

October 15-17, 2026 | The Biltmore Los Angeles Hotel, Los Angeles, CA

The ARS Guest Countries

Australia, Brazil,

Malaysia, Singapore



FALL FILM FESTIVAL

*The ARS will again be featuring the **Fall Film Festival** - a **video seminar** featuring the most educational, unique and impressive videos of cases, complications and challenges submitted by the membership.*

The videos were reviewed by an appointed committee and rated equally on rarity of pathology, technical complexity, novelty of procedure, educational value, and production quality. The top-rated videos (time-permitting) will be showcased at the meeting with an opportunity for the video editors to introduce each clip and respond to questions from the audience.

Friday, October 16, 2026

12:15 pm – 1:00 pm

Room: Bernards



Amber Luong, MD, PhD, FARS

Presidential Welcome

Welcome to the 72nd Annual Meeting of the American Rhinologic Society at the historic Biltmore Los Angeles Hotel.

As we gather in Los Angeles, I am reminded of how much the American Rhinologic Society has accomplished and how important it has become to our specialty. For more than seven decades, the ARS has advanced the care of patients with rhinologic and skull base disease through education, research, innovation, mentorship, and collaboration. What began as a relatively small group of physicians with a shared interest in rhinology has grown into a vibrant and influential organization representing our specialty nationally and internationally.

The strength of the ARS is ultimately its membership. Our Society brings together physicians from academic medicine and private practice, established leaders and those just beginning their careers, as well as colleagues from around the world. Through our committees, sections, research initiatives, educational programs, advocacy efforts, and publications, the ARS provides opportunities for members at every stage of their careers to contribute to the advancement of rhinology.

The scientific accomplishments of our members continue to expand the boundaries of our field. ARS members have helped define modern approaches to inflammatory sinonasal disease, advanced endoscopic sinus and skull base surgery, developed and evaluated new technologies and therapeutics, and generated research that has changed how we understand and treat rhinologic disease. Just as importantly, the Society has fostered generations of rhinologists through mentorship, fellowship training, collaboration, and the exchange of ideas.

The ARS also continues to strengthen its voice on issues affecting our patients and our profession. At a time when medicine faces increasing regulatory, economic, and scope-of-practice challenges, a strong professional society is more important than ever. Our ability to advocate effectively, support meaningful research, educate the next generation, and advance the care of our patients depends upon an engaged and unified membership.

As I look at what the ARS has accomplished and where it is headed, I am extraordinarily proud of this Society and grateful to everyone who has contributed to its success. I encourage each of you to remain involved, seek out opportunities to contribute, and help shape what comes next.

On behalf of the Board of Directors and ARS leadership, thank you for being part of the American Rhinologic Society and for everything you do for our specialty and our patients. I hope you enjoy the meeting, reconnect with old friends, build new relationships, and take a moment to celebrate both how far our Society has come and the opportunities that lie ahead.

Amber Luong, MD, PhD, FARS
President, American Rhinologic Society



Marcx Dubin, MD, FARS

Welcome from the President Elect and 72nd Annual Meeting Program Chair

Welcome to the 72nd Annual Meeting of the American Rhinologic Society in Los Angeles.

Our Annual Meeting gives us the opportunity to come together as a community, share new science, challenge how we think, and reconnect with colleagues and friends. This year's program reflects the breadth, energy, and continued evolution of our specialty.

We will open with our top clinical and basic science abstracts followed by the Hwang Family Lectureship, delivered by Dr. Sarah Wise. Dr. Michael Sillers will present the David W. Kennedy Lectureship, sharing the story of how innovation and collaboration helped launch modern rhinology. We are also pleased to welcome Dr. Bobby Mukkamala, Immediate Past President of the American Medical Association, who will bring a national perspective on physician leadership and advocacy.

The scientific program was designed to be practical, candid, and interactive. Panels will tackle recalcitrant chronic rhinosinusitis without polyps, olfactory dysfunction, posterior nasal nerve ablation, biologic use, grant review, and choosing the right practice setting. Alongside these sessions, an outstanding group of oral and poster presentations will highlight the clinical, translational, and basic science work moving our field forward.

This meeting also expands our commitment to mentorship and professional development. The new Poster Mentorship Session will bring trainee presenters together with experienced rhinologists for focused feedback and discussion. Women in Rhinology, the Skull Base and Orbital Surgery Section, Rhinologists in Private Practice, and RAPPers will each host events, and the President's Reception will give us a chance to celebrate the work and relationships that sustain the Society.

We will conclude with a joint session with the American Academy of Otolaryngology-Head and Neck Surgery at the Los Angeles Convention Center. This collaboration broadens the conversation beyond rhinology and reinforces the value of working together across our specialty. We are also delighted to welcome colleagues from Australia, Brazil, Malaysia, and Singapore as our guest countries.

The historic Biltmore and the city of Los Angeles provide an exceptional setting for this year's meeting. I hope you take time to enjoy both while you are here. More importantly, I hope you leave with new ideas, renewed connections, and the same sense of momentum that shaped this program.

Thank you for contributing your work, your time, and your commitment to the ARS. I look forward to seeing you in Los Angeles.

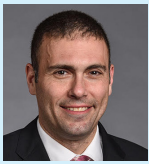
Marc Dubin, MD

President-Elect and Program Chair
American Rhinologic Society

American Rhinologic Society Executives - 2026



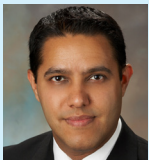
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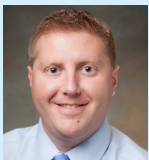
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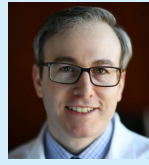
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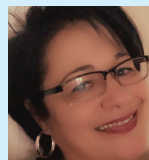
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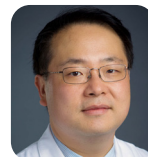
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Devyani Lal, MD, FARS



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Edward Kuan, MD, FARS

Angela Donaldson, MD, FARS

Christopher Ito, MD, FARS

Jose Mattos, MD

Brent Senior, MD, FARS

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Arthur Wu, MD, FARS

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William Yao, MD, FARS

David Yen, MD

ARS Mission Statement

The American Rhinologic Society's mission is to serve, represent and advance the science and ethical practice of rhinology. The Society promotes excellence in patient care, research and education in Rhinology and Skull Base Disorders. The American Rhinologic Society is dedicated to providing communication and fellowship to the members of the Rhinologic community through on-going medical education, patient advocacy, and social programs. The ARS continuing medical education activities serve to improve professional competence, performance, and promote research.

Business/ACCME

Continuing Education

Accreditation Statement

The American Rhinologic Society (ARS) is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

Credit Designation Statement

ARS designates this live activity for a maximum of 9.75 AMA PRA Category 1 Credit(s)[™]. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Learning Objectives from Practice Gaps

At the conclusion of this meeting participants will be able to:

- Integrate emerging clinical and translational evidence regarding chronic rhinosinusitis pathophysiology, inflammatory endotypes, environmental influences, and the sinonasal microbiome into the evaluation and management of patients with CRS.
- Evaluate current medical, biologic, and surgical treatment strategies for chronic rhinosinusitis to individualize care for patients with persistent or recalcitrant disease, including CRSwNP and CRS without nasal polyps.
- Apply current evidence for the evaluation and management of olfactory dysfunction and chronic rhinitis, including evolving pharmacologic, procedural, and posterior nasal nerve–targeted interventions.
- Assess emerging diagnostic, predictive, and procedural technologies in rhinology, including artificial intelligence, machine learning, advanced imaging, and other innovations, for their potential application to clinical decision-making and patient outcomes.
- Incorporate evidence-based approaches to surgical decision-making and perioperative care in rhinologic practice, including assessment of surgical extent, postoperative management, complication prevention, and patient-centered outcomes.

How to Obtain Your CME Certificate

At the conclusion of the meeting, you will be provided with a post-meeting link to claim your CME.

ARS 72nd Annual Meeting - IFAR Peer Review

At IFAR, we aspire to peer review performed with fairness, rigor, and timeliness. Peer review is thankless work and voluntary. Peer reviewers offer criticism and/or praise to challenge thinking, provide honest feedback, and ultimately improve the scientific method. This is a great service to our specialty, the profession of medicine, and to humankind.

The editorial board, Associate Editors, and Editor greatly appreciate the following individuals for the reviews they submitted in 2025.

-- Timothy L. Smith, MD, *Editor, International Forum: Allergy & Rhinology*

Top Reviewers

Dara Dara Adams, MD	Patricia Loftus, MD, FARS
Omar Ahmed, MD, FARS	Nyall London, MD, FARS
Jeremiah Alt, MD, PhD, FARS	Amber Luong, MD, PhD, FARS
Noel Ayoub, MD	Chadi Makary, MD, FARS
Kody Bolk, MD	Sonya Marcus, MD
Raewyn Campbell, MD, FARS	Michael Marino, MD, FARS
Michael Chang, MD, FARS	Conner Massey, MD
Nikita Chapurin, MD	Justin McCormick, MD
Garret Choby, MD, FARS	Amar Miglani, MD
Naweed Chowdhury, MD	Vivek Pandrangi, MD
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Thomas Edwards, MD	Lauren Roland, MD
Jacob Eide, MD, FARS	Ryan Rimmer, MD, FARS
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David Gudis, MD, FARS	Jeffrey Suh, MD, FARS
Dipesh Gyawali	Dennis Tang, MD, FARS
Ashoke Khanwalkar, MD, FARS	Justin Turner, MD, FARS
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Michael Kohanski, MD, FARS	Alan Workman, MD
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Michael Stewart, MD, FARS

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Micah Likness, MD
Brian Lobo, MD, FARS
Chadi Makary, MD, FARS
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Hannan Qureshi, MD, FARS
Amrita Ray, MD, FARS

Perry Santos, MD
Rodney Schlosser, MD, FARS
Brent Senior, MD, FARS
Daniel Spielman, MD

Silver Champions

Ashleigh Halderman, MD, FARS
Christian Hall, MD, FARS
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Jean Kim, MD, FARS
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Russell Reitz, MD
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Christopher Roxbury, MD, FARS

Bronze Champions

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Mamie Higgins, MD
Elisa Illing, MD, FARS
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Eyad Khabbaz, MD
Li-Xing Man, MD, FARS
Adam Pleas, MD
B. Todd Schaeffer, MD
Mr. Cal Tarrant

Friend Champions

Ulrich Ecke, MD
James Oberman, MD
Lindsey Ryan, MD

Patron Champion

Anonymous

As of 9/17/26

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1984 - 1985	George C. Facer, MD	2017 - 2018	Richard Orlandi, MD, FARS
1985 - 1986	Larry E. Duberstein, MD	2018 - 2019	James Palmer, MD, FARS
1986 - 1987	Glenn W. Drumheiler, DO	2019 - 2020	Robert Kern, MD, FARS
1987 - 1988	Alvin Katz, MD	2020 - 2021	Joseph Han, MD, FARS
1988 - 1989	Donald Leopold, MD, FARS*	2021 - 2022	Rodney Schlosser, MD, FARS
1990 - 1991	Pierre Arbour, MD	2022 - 2023	Sarah Wise, MD, FARS
1991 - 1992	Fred Stucker, MD, FARS	2023 - 2024	Pete Batra, MD, FARS
		2024 - 2025	Kevin Welch, MD, FARS

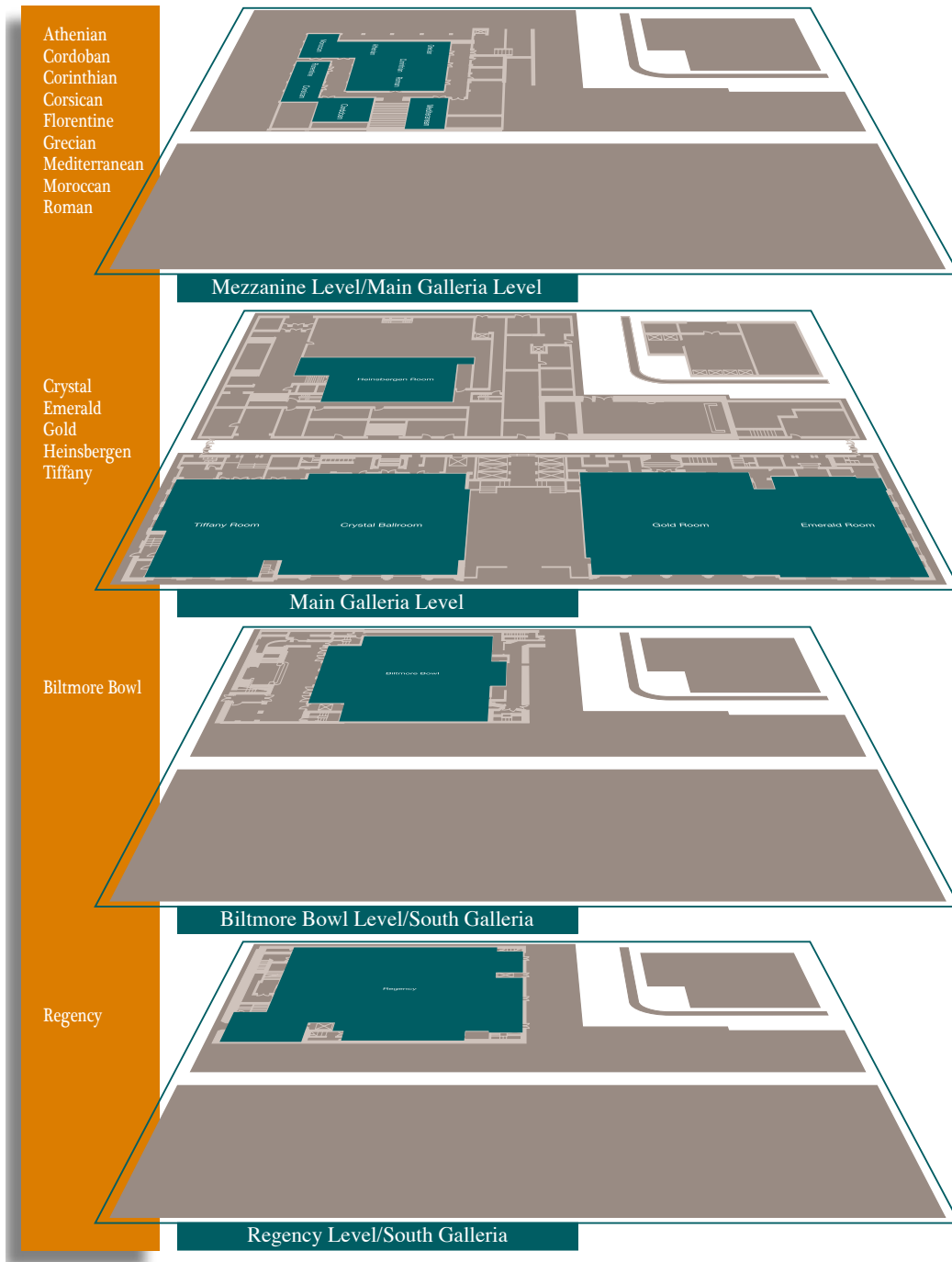
*Deceased

Past Secretaries

2023 - Present	R. Peter Manes, MD, FARS	1995 - 1999	Frederick Stucker, MD, FARS
2019 - 2023	Rakesh Chandra, MD, FARS	1990 - 1995	Frank Lucente, MD
2015 - 2019	Pete Batra, MD, FARS	1985 - 1990	George Facer, MD
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2005 - 2008	Brent A. Senior, MD, FARS	1970 - 1975	Ralph H. Riggs, MD
1999 - 2005	Marvin P. Fried, MD, FARS		

Meeting Floor Plan

Meeting Room Locations



PROGRAM ABSTRACTS

MEETING HIGHLIGHTS

The 2026 Annual Meeting at the historic Millennium Biltmore Hotel will feature a dynamic mix of cutting-edge science, practical rhinology, career development, and advocacy-focused programming.

The meeting will open with a high-impact combined session highlighting top abstracts and the prestigious 5th Annual Hwang Lecture, featuring Sarah Wise, MD.

The 22nd Annual Kennedy Lecture will feature Michael Sillers, MD and serve as one of the signature educational events of the meeting.

A featured guest appearance by Bobby Mukkamala, Immediate Past President of the American Medical Association, will bring a national perspective on healthcare policy, advocacy, physician leadership, and the future of medical practice.

The scientific program will emphasize interactive panel-based education focused on real-world rhinology controversies and evolving standards of care.

ARS expands trainee engagement with new Poster Mentorship Reception

Maximum of 9.75 AMA PRA Category 1 Credit(s)[™]

Highlighted panel topics include:

- Recalcitrant CRS Without Polyps: Still Not Better... Now What?
- Olfactory Dysfunction: Where We Are and What Do We Actually Have to Offer?
- PNN Ablation: Game Changer or Current Trend?"
- Inside the Review Room: A Mock Grant Review for Industry-Sponsored and NIH-Style Research Proposals
- Biologics: Our Current Consensus on Usage
- Practice Selection: Which Setting is Best for You?

The meeting will conclude with a collaborative Joint Session with the American Academy of Otolaryngology–Head and Neck Surgery at the Los Angeles Convention Center, highlighting interdisciplinary collaboration and expanded educational opportunities for attendees.

Resident's Course

Wednesday, October 14, 2026

1:00 pm – 5:00 pm
Didactic Lectures - Junior Track
Room: Emerald
By Invitation Only

1:00 pm – 5:00 pm
Residents Dissection Lab - Senior Track
Stryker Mobile Lab
Outside Parking Lot
By Invitation Only

6:00 pm – 7:30 pm
Resident's Reception
Room: Heinsbergen

Thursday, October 15, 2026

7:00 am – 8:00 am
Resident's Course Breakfast
Room: Emerald
By Invitation Only

8:00 am – 12:00 pm
Resident's Course Didactic Lectures - Senior Track
Room: Emerald
By Invitation Only

8:00 am – 12:00 pm
Resident's Dissection Lab - Junior Track
Stryker Mobile Lab
Outside Parking Lot
By Invitation Only

PROGRAM ABSTRACTS

Thursday, October 15, 2026

11:00 am – 3:00 pm

Women in Rhinology Leadership Event

Room: Crystal, Lobby Level

3:00 pm – 7:00 pm

ARS Board of Directors Meeting

Room: Tiffany, Lobby Level

7:00 pm – 9:00 pm

Rhinologists in Private Practice Event

Room: Gold, Lobby Level

7:00 pm – 9:00 pm

Skull Base and Orbital Surgery Section Ergonomics Event

Room: Crystal, Lobby Level

Friday, October 16, 2026

General Session

Biltmore Bowl

8:00 am – 12:10 pm

8:00 am – 8:05 am

Welcome

Marc Dubin, MD, FARS

ARS President-Elect and Program Chair

8:05 am – 8:19 am

President's Address

Amber Luong, MD, PhD, FARS

ARS President

Room Moderator: Marc Dubin, MD, FARS

Oral Presentations: Top 5 Clinical Science

Session Moderators: Charles Ebert, Jr., MD, FARS; Jessica Grayson, MD

8:20 am – 8:27 am

FLAVOR phase 2 RCT: Theophylline nasal spray for persistent post-viral hyposmia

Masayoshi Takashima, MD, FARS

Akshay Prabhakar, BSA

Jennifer A. Villwock, MD

Greg E. Davis, MD, MPH, FARS

Pete S. Batra, MD, FARS

Bryan M. Davis, MD

Douglas D. Reh, MD, FARS

Marc G. Dubin, MD, FARS

Rodney J. Schlosser, MD, FARS

Eugene G. Brown III, MD, RPh

Omar Ahmed, MD, FARS

Background:

Persistent post-viral hyposmia lacks approved pharmacologic therapy. Theophylline preserves cAMP levels in olfactory receptor neurons, enhancing signaling at the olfactory epithelium. We evaluated theophylline nasal spray (CYR-064) for persistent post-viral hyposmia.

Methods:

In this phase 2 randomized, double-blind, placebo-controlled trial at 14 US centers, adults with post-viral hyposmia of 6-30 months' duration were randomized 1:1:1 to CYR-064 560 µg/day (low-dose), CYR-064 1120 µg/day (high-dose), or placebo for 24 weeks. Primary endpoints were safety and tolerability. Secondary endpoints included changes in VRS Smell (0-3) and NRS-11 Smell-PRO (0-10) at Week 24. A pre-specified per-protocol analysis (PP2) excluded participants ≥60 years and those treated <90 days.

Results:

Of the 151 participants (randomized to 51 low-dose, 50 high-dose, 50 placebo), 63.6% were female and 88.1% had moderate-to-severe olfactory dysfunction (VRS 2 or 3). CYR-064 was well-tolerated with a safety profile comparable to placebo; no drug-related serious adverse events occurred. In the Intent-to-Treat population, high-dose CYR-064 showed a favorable efficacy trend ($p=0.072$ - 0.094). In PP2, high-dose CYR-064 improved VRS Smell (LS mean difference -0.61 ; $p=0.002$), VRS 1-point responder rates, average 43% improvement (57.6% vs. 24.0%; $p=0.016$), and NRS-11 Smell-PRO responder rates, average 32% improvement (68.6% vs. 32.0%; $p=0.008$). Benefit was most pronounced in participants aged 18-59 with severe baseline dysfunction (77.8% vs. 29.4%; $p=0.007$).

PROGRAM ABSTRACTS

Conclusions:

CYR-064 demonstrated a favorable safety profile over 24 weeks. High-dose theophylline nasal spray produced significant olfactory improvement in younger patients with severe disease.

8:28 am – 8:35 am

CDHR3 risk variant and epithelial dysplasia predict infection in CRS

Eugene Chang, MD, FARS

Nirushan Narendran, PhD, MS

Joseph Irish, Research Technician

Anthony Botros

Sameena Rahman, Medical Student

McKenna Schultz

Hanna Johnson

University of Arizona

Background:

Postoperative infection following endoscopic sinus surgery (ESS) contributes to poor outcomes in chronic rhinosinusitis (CRS), yet reliable predictors of high-risk patients remain poorly defined. We aimed to identify genetic and histopathologic factors associated with infection risk.

Methods:

We conducted a longitudinal cohort study of 216 CRS patients undergoing ESS (103 CDHR3 risk genotype [AA/AG]; 113 wildtype [GG]) with follow-up over one year. Infection was defined by endoscopic mucopurulence with confirmatory positive bacterial culture. Mixed-effects logistic regression with patient-level random intercepts assessed associations among CDHR3 genotype, surgical pathology, nasal polyp status, allergic rhinitis, and comorbidities.

Results:

CDHR3 genotype, epithelial dysplasia, and lymphocytic infiltration were associated with increased infection risk in unadjusted analyses. In multivariable models, CDHR3 risk genotype remained independently predictive (OR 2.64, $p=0.001$). Dysplasia (OR 3.88, $p=0.002$) and lymphocytic infiltrate (OR 3.53, $p=0.004$) were strong histopathologic predictors. Diabetes (OR 2.93, $p=0.002$) and prior infection (OR 1.80, $p=0.046$) were also independently associated. Dysplasia had an amplified effect among CDHR3 risk carriers (OR ~8, $p<0.001$).

Conclusion:

Postoperative infection risk in CRS is driven by genetic susceptibility and epithelial pathology. CDHR3 risk genotype and epithelial dysplasia define high-risk subgroups with a synergistic effect, supporting risk stratification and targeted therapeutic strategies in recalcitrant disease.

8:36 am – 8:43 am

Air pollution associated alterations in the sinonasal microbiome and inflammatory signaling

Hong-Ho Yang, MD

Karl O'Sharkey, PhD

Jeffrey Suh, MD, FARS

Marilene B. Wang, MD, FARS

Daniel Beswick, MD, FARS

Kimberly Paul, PhD

Jonathan Jacobs, MD, PhD

Jivianne Lee, MD, FARS

Introduction:

Air pollution is an emerging driver of airway inflammation. Given the role of microbiome dysbiosis in CRS, we evaluated the relationships between pollutant exposure, microbiome composition, and inflammatory signaling.

Methods:

Sinonasal mucosal specimens from 90 adults (30 control, 30 CRSwNP, 30 CRSsNP) underwent cytokine profiling (Luminex) and microbiome characterization (16S rRNA and ITS sequencing). Exposure to pollutants was estimated using a spatiotemporal land-use regression model incorporating geocoded residential information and mobility patterns.

Results:

Adjusting for demographics, comorbidities, and tobacco use, higher PM_{2.5} exposure was associated with reduced bacterial diversity (Shannon index; β -0.25 per SD, 95% CI [-0.42, -0.09], $P=0.004$), with similar effects observed for NO₂ and combustion-related air toxics (benzene, nickel). PM_{2.5}, benzene, nickel, butadiene, and chromium were also associated with shifts in microbial community composition, each independently explaining 1.5–1.7% of bacterial and up to 2.1% of fungal variance ($P<0.001$). Pollutant exposure was linked to divergent inflammatory signaling, with elevations in both type 2 (T2) and non-type 2 (NT2) cytokines. NT2 cytokines were associated with reduced microbial

PROGRAM ABSTRACTS

diversity (IL-6: β -0.33[-0.50, -0.16], $P < 0.001$; TNF- α : β -0.28[-0.47, -0.09], $P = 0.008$), while T2 cytokines (IL-4,5,13) were associated with relatively preserved diversity.

Conclusion:

Air pollution is associated with bacterial and fungal dysbiosis, characterized by reduced diversity and altered community structure. These changes preferentially align with NT2 inflammation, whereas pollution-associated T2 signaling appears to reflect a distinct, microbiome-independent pathway.

8:44 am – 8:51 am

Remission: Does it really exist? A transcriptomic assessment

Martin Desrosiers, MD

Sheherazade Jannat, Research Coordinator

Audrey Pelletier, Post Doctoral Researcher

Laendra Mfuna Endam, Research Coordinator

Joana Viana, Bioinformatician

Francois Lavigne, MD

Centre Hospitalier de l'Université de Montréal (CHUM)

Background:

Remission under therapy suggests that sustained treatment may induce disease normalization. We verified whether post-ESS remission under medication resembles non-diseased tissue at the clinical and transcriptomic levels.

Methods:

Clinical parameters and transcriptomic profiles from endoscopic sinus brushings were analyzed in three groups: (i) healthy volunteers with no nasal symptoms and normal olfaction (UPSIT $\geq 34/40$; $n=12$); (ii) post-ESS CRSwNP patients in remission with normal endoscopy (LMK 0/2) under a) INCS ($n=12$); (b) dupilumab ($n=12$).

Results:

Symptom scores, endoscopic findings and FeNO levels were comparable between remission groups and healthy volunteers, however, transcriptomic analysis revealed persistent differences. Compared to healthy volunteers, INCS-treated patients exhibited 484 differentially expressed genes (DEG) at $\text{Padj} \leq 0.05$ and $|\log_2\text{FC}| \geq 1.3$, while dupilumab-treated patients showed 436 DEGs. INCS remission was characterized by local immunosuppression (MHC complex, enzyme activity) and activation of epithelial functions associated with

transmembrane and ionic exchanges. In dupilumab remission, Cadherin-binding function was deregulated, protein metabolism/activity was suppressed, and epithelial functions for transmembrane and ionic exchanges were activated.

Conclusions:

Clinical remission following ESS with continued medical therapy results in minimal disease burden and near-normal clinical status, save for possible residual olfactory impairment. However, Persistent transcriptomic abnormalities despite similar clinical aspects indicate that remission does not equate to molecular normalization thus a cure is not likely and continued long-term therapy is required.

8:52 am – 8:59 am

Association of type 3 inflammation with clinical outcomes in chronic rhinosinusitis

Michael Papazian, MD

Brian Cameron, MD

Mason Kryszinski, MD

Ping Li, Staff Scientist

Rakesh Chandra, MD, FARS

Justin Turner, MD, FARS

Naweed Chowdhury, MD

Vanderbilt University Medical Center

Introduction:

Type 3 (T3) inflammation, characterized by elevated IL-17A, has been associated with recalcitrant chronic rhinosinusitis (CRS) and increased disease burden, but its clinical phenotype remains incompletely characterized. We sought to define the clinical implications of elevated T3 cytokine levels in CRS.

Materials:

712 adult CRS patients undergoing endoscopic sinus surgery (2015–2024) were prospectively enrolled. Intraoperative nasal mucus cytokines were measured via multiplex bead assay and log-transformed for statistical analysis. Patients were dichotomized into high and low T3 signal using the median IL-17A level. Demographics, clinical features, and pre- and postoperative outcomes were compared using Spearman's correlation and regression models.

Results:

Among 712 patients, 397 (56%) had low IL-17A (< 0.06 pg/mL) and 315 (44%) had high IL-17A

PROGRAM ABSTRACTS

(>0.06 pg/mL). Patients with high IL-17A were more likely to have nasal polyps than those with low IL-17A (69% vs 49%, $p<0.001$). IL-17A correlated with preoperative Lund-Mackay ($R_s=0.22$) and SNOT-22 scores ($R_s=0.13$). High IL-17A patients were more likely to have prior sinus surgery (OR 1.9, $p=0.002$), receive postoperative steroids (OR 3.0, $p<0.001$), and be prescribed biologics post-operatively (OR 2.3, $p<0.001$). Among patients with nasal polyps, high IL-17A was associated with increased postoperative polyp recurrence (OR 4.2, $p<0.001$).

Conclusions:

Elevated IL-17A is associated with increased disease severity and reduced treatment response in CRS. Mechanisms of treatment recalcitrance in high T3 disease warrants further study, especially in mixed endotypes with high type 2 disease.

9:00 am – 9:05 am

Q&A

9:05 am – 9:15 am

Awards Ceremony

Charles Ebert, Jr., MD, FARS

9:15 am – 10:00 am

Hwang Family Lectureship

Guest Speaker: Sarah Wise, MD, FARS

Title: The Challenges That Our Mentors Face Can Give Us Strength

10:00 am – 10:36 am

Break with Exhibitors in Regency

Oral Presentations: Top 5 Basic Science

Session Moderators: Angela Donaldson, MD, FARS; David Gudis, MD, FARS

10:37 am – 10:44 am

RADA16 as a drug-delivery scaffold for pseudomonas sinusitis

Do-Yeon Cho, MD

Daniel Skinner, BS

Shaoyan Zhang, PhD

Caydn Campbell, BS

Jessica Grayson, MD

Bradford Woodworth, MD, FARS

Justin Turner, MD, FARS

University of Alabama at Birmingham

Background:

Topical antibiotic failure in chronic rhinosinusitis is driven by poor drug retention and epithelial dysfunction. RADA16, a self-assembling peptide hydrogel used for wound healing, offers a unique opportunity to convert transient drug exposure into sustained, localized therapy. We hypothesized that RADA16-mediated antibiotic delivery would enhance bacterial clearance and restore epithelial function in *Pseudomonas aeruginosa* sinusitis.

Methods:

A rabbit model of maxillary sinusitis was established using the PA14 strain of *P. aeruginosa* ($n=12$). Animals were randomized to: (1) control, (2) ciprofloxacin alone (5 mg/mL; 0.8 mL), or (3) RADA16 with ciprofloxacin ($n=4$, each). A separate cohort ($n=3$) received RADA16 alone to assess biocompatibility. Animals were followed for 2 weeks after treatment. Outcomes included sinus potential difference (SPD: functional) and histologic analysis (structural recovery).

Results:

RADA16 alone demonstrated no evidence of epithelial toxicity. Combination therapy produced a marked enhancement in epithelial function, with significantly greater SPD polarization (mV) (-11.6 ± 4.3) compared with ciprofloxacin alone (-6.7 ± 5.5) and control (-0.7 ± 0.3 ; $p<0.05$). This functional recovery was accompanied by substantial structural improvement (μm), including reduced epithelial thickness (23.1 ± 3.5 vs. 29.4 ± 4.0 and 32.3 ± 8.5 ; $p<0.0001$) and markedly decreased subepithelial inflammation (79.4 ± 12.0 vs. 198.7 ± 37.0 and 179.2 ± 64.6 ; $p<0.0001$).

Conclusions:

RADA16 enhanced topical antibiotic efficacy and promoted epithelial recovery in *Pseudomonas* sinusitis. These data position RADA16 as a platform technology with immediate translational potential for refractory sinusitis and other biofilm-driven airway disease.

PROGRAM ABSTRACTS

10:45 am – 10:52 am

Tuft cell expansion is steroid resistant in vitro in chronic rhinosinusitis with nasal polyps

Michael Kohanski, MD, PhD, FARS

Li Hui (Tiffany) Tan

Deepa Keshari

Nithin Adappa, MD

James Palmer, MD, FARS

Jennifer Douglas, MD

Noam Cohen, MD, PhD, FARS

Background:

Tuft cells act as epithelial sensors and amplifiers of type 2 inflammation. Increased sinonasal tuft cell abundance is observed in chronic rhinosinusitis with nasal polyps (CRSwNP), but whether these cells are markers or drivers of disease remains unclear. Additionally, the effects of corticosteroids and IL 4/IL 13–targeting biologics on tuft cell hyperplasia are not defined.

Methods:

Epithelial cells derived from nasal polyps of patients with CRSwNP were differentiated at air–liquid interface. Cultures were treated with IL 13 (50 ng/mL) to induce tuft cell expansion, with or without dexamethasone (1 μ M) or dupilumab biosimilar (100 ng/mL). Tuft cells were quantified by immunostaining for the tuft cell transcription factor POU2F3. Sequential treatment with IL 13 followed by dupilumab biosimilar for 2.5 weeks was used to assess effects on established tuft cells.

Results:

IL 13 significantly increased tuft cell abundance compared with untreated controls (13 ± 12 POU2F3⁺ cells/HPF; $p = 0.0001$). Co treatment with dupilumab biosimilar significantly reduced IL 13–induced tuft cells (6 ± 3 cells/HPF; $p = 0.0052$). In contrast, dexamethasone did not reduce tuft cell hyperplasia (83 ± 69 cells/HPF). Sequential treatment showed that dupilumab biosimilar prevented de novo tuft cell expansion but did not reduce pre existing IL 13–expanded tuft cells.

Conclusions:

IL 13–driven tuft cell hyperplasia is steroid resistant, suggesting persistent tuft cells may enable rapid re amplification of type 2 inflammation after steroid withdrawal. IL 4/IL 13 blockade prevents new tuft cell differentiation but does not promote tuft cell loss. Targeting tuft cells may offer a novel durable, steroid sparing

therapeutic strategy in CRSwNP.

10:53 am – 11:00 am

TREM2^{hi} macrophages and type 2 inflammation in CRSwNP

Amarbir Gill, MD

Yiran Li

Marc Hershenson

Johann Gudjonsson

Bangqiao Yin

Rachael Bogle

Lam Tsoi

Jennifer Fox

Introduction:

The mechanisms driving type 2 inflammation in chronic rhinosinusitis with nasal polyps (CRSwNP), particularly the role of macrophages, remains incompletely defined.

Methods:

Single-cell RNA-sequencing (10X Genomics) was performed on anterior ethmoid (AE) tissue from controls ($n=5$), as well as AE ($n=8$) and nasal polyp (NP) tissue ($n=6$) from patients with CRSwNP. Cell populations were identified and differential gene expression analyses were conducted comparing AE and NP to controls. Key findings were further validated with histological and immunofluorescence imaging.

Results:

A total of 78,359 high-quality cells were resolved into 17 epithelial, immune, and stromal clusters. Gene set enrichment analysis revealed both shared and compartment-specific pathways in AE and NP. Compared to control, AE (more than NP) demonstrated expansion of TREM2⁺ myeloid cells enriched in lipid metabolic pathways. Two transcriptionally distinct TREM2⁺ macrophage subsets were identified, with gene signatures consistent with M1-like (e.g., CXCL2, TNF) and M2-like (e.g., MRC1, CD163) polarization states. These subsets were validated in situ by immunofluorescence (TREM2⁺CD163⁺ and TREM2⁺iNOS⁺). TREM2 expression correlated with type 2 cytokine transcripts (IL5, IL13) and tissue remodeling genes (FN1, MMP9).

Conclusion:

CRSwNP is characterized by expansion of TREM2^{hi} macrophages with distinct polarization states that are strongly associated with type 2 inflammatory and tissue remodeling. These findings highlight TREM2⁺ macrophages as

PROGRAM ABSTRACTS

potential contributors to disease pathogenesis and therapeutic targets.

11:01 am – 11:08 am

Novel orphan non-coding RNA signatures reveal endotype-specific regulatory programs in CRS

Hoang Bui-Nguyen, MD, PhD
Pallavi Madhusudanan, Postdoctoral Fellow
Stacey Gray, MD, FARS
Benjamin Bleier, MD, FARS
Alan Workman, MD, MTR
Massachusetts Eye and Ear Infirmary, Harvard Medical School

Background:

Chronic rhinosinusitis (CRS) is a heterogeneous inflammatory disorder, yet current classification based on nasal polyps (CRSwNP vs CRSsNP) fails to capture the molecular diversity driving treatment response and prognosis. Orphan non-coding RNAs (oncRNAs), recently shown to be of significant diagnostic and prognostic value in head and neck cancers, remain largely unexplored in inflammatory diseases. We therefore sought to identify endotype-specific oncRNA signatures and their relationship to clinical outcomes.

Methods:

Ethmoid mucosal tissues were collected from 30 subjects (Control n=10, CRSsNP n=10, CRSwNP n=10) and subjected to high-throughput small RNA sequencing. A machine learning-based classifier, previously validated in cancer diagnostics with >90% accuracy, was applied to distinguish CRS endotypes.

Results:

We identified 301 unique disease-specific oncRNAs in CRSsNP and 2109 in CRSwNP. Both CRSsNP and CRSwNP exhibited distinct endotype-specific expression profiles. PCA using random genomic location showed minimal separation between groups; however, restriction to endotype-specific ncRNAs produced clear clustering of Control, CRSsNP, and CRSwNP samples ($p < 0.001$ by PERMANOVA), supporting robust endotype differentiation. Additionally, across both subtypes, aggregate RNA expression correlated with disease severity (Spearman $\rho = 0.62$, $p = 0.004$).

Conclusions:

This study introduces a novel, oncRNA-based

approach to endotyping CRS, revealing molecular signatures that extend beyond traditional classifications. These findings demonstrate that different subtypes of CRS harbor unique post-transcriptional landscapes with strong clinical correlation, potentially enabling more precise, targeted therapeutic strategies.

11:09 am – 11:16 am

Resequencing the international sinonasal microbiome study cohort defines dysbiosis in CRS

Isabella Burdon, MBBS-VI, PhD-III
Lindsay Durr
Clare Cooksley, Dr.
Emma Barry
Nicholas Christopher Vrodos
Ahmed Bassiouni
Mahnaz Ramezanzpour, Dr.
Claudio Callejas, Dr.
Sarah Vreugde, Professor
Peter John Wormald, Professor
Alkis James Psaltis, Professor
The University of Adelaide

Chronic rhinosinusitis (CRS) is a prevalent and debilitating inflammatory disease. While advances in biologic therapies have transformed CRS management, they do not induce remission with return of symptoms upon withdrawal of treatment. This pattern suggests that, in addition to inflammatory pathways, alternative mechanisms may contribute to CRS pathogenesis. In 2025, our department published the first benchmarking study for sinus microbiome sequencing, finding that the 16S rRNA methods applied in all prior studies significantly distorted samples, with only metagenomic analysis generating accurate results. Hence, to definitively investigate the role of dysbiosis in CRS, we present the first international sinus microbiome study to integrate paired metagenomic and 16S rRNA sequencing.

Swab samples of the middle meatus from 432 participants (174 controls; 155 CRS with nasal polyps [wNP]; 103 CRS without nasal polyps [sNP]) were collected across 14 centres in 9 countries. Metagenomic libraries were prepared using the ONT native barcoding kit and sequenced on the PromethION platform. Data was analysed using an in-house pipeline with Sourmash for taxonomic assignment. CRS microbiomes differed significantly from non-CRS controls and between disease phenotypes. *C. accolens* was strongly associated with health

PROGRAM ABSTRACTS

($p=0.001$, $\beta=5$), as was *D. pigrum* ($p=0.017$, $\beta=2$). In contrast, *P. aeruginosa*, *S. pneumoniae*, and *H. influenzae* were significantly enriched in CRS ($p<0.05$, $\beta=3;4;4$). *S. aureus* was associated with CRSwNP ($p=0.033$, $\beta=6$), while *C. kefirresidentii* was enriched in CRSsNP ($p=0.008$, $\beta=4$).

This is the first study to define dysbiosis in CRS in an international cohort at a species level, linking clinically relevant bacteria to disease presence.

11:17 am – 11:22

Q&A

11:22 am – 11:25 am

Introductions

11:25 am- 12:10 pm

Lecture

Guest Speaker: Srinivas (Bobby) Mukkamala, MD, PLC

Immediate Past President, American Medical Association

“Physician Leadership in Advocating for a Healthier Tomorrow”

12:10 pm – 1:00 pm

5th Annual Hwang Family Lectureship Lunch

Room: Heinsbergen, Lobby Level

12:10 pm – 1:00 pm

Lunch with Exhibitors in Regency

12:15 pm – 1:00 pm

Fall Film FESStival

Room: Bernards

Friday, October 16, 2026

General Session – Biltmore Bowl

1:00 pm – 5:00 pm

Room Moderator: Benjamin Bleier, MD, FARS

Session Moderators: Anthony Del Signore, MD, FARS; Lauren Roland, MD

1:00 pm – 1:06 pm

Predicting ESS benefit in CRS with multilevel ML and expert benchmarking

Vijay Ramakrishnan, MD

Indiana University School of Medicine

Introduction:

ESS is generally beneficial for CRS overall, but

individual outcomes can be highly variable. We rigorously developed an interpretable model to predict individual SNOT-22 outcomes, and benchmark it against predictions expert rhinologists.

Methods:

We analyzed data from a NIH-funded multicenter prospective CRS surgical cohort ($n=524$). Using preoperative clinical features, we trained logistic regression, SVM, random forest, Naïve Bayes, multilayer perceptron (MLP), XGBoost, and ensemble strategies with stratified validation. The endpoint was 6-month SNOT-22 improvement meeting the MCID (8.9 points). We also performed permutation importance and SHAP analyses for explainability, and compared the best model with six board-certified rhinologists on a 30-case uncertainty-stratified blinded benchmark.

Results:

The optimized MLP performed best, with ~0.85 held-out accuracy and the strongest minority-class detection (class 0 $F1=0.53$), outperforming other ML approaches and more complex ensembles that added little (majority vote accuracy 0.857; stacking 0.810). On the 30-case benchmark, the MLP achieved 80% accuracy versus 75.6% for individual human experts and 76.7% for the six-expert panel, while a gen-AI baseline reached only 56.7% accuracy. Baseline SNOT-22, CT score, age, allergy status, and prior surgery were the most influential predictors. Expert rhinologists concurred with ML feature importance ratings.

Discussion:

Optimized ML modeling using standard clinical data perform favorably to expert judgment in the task of predicting ESS outcomes for individual CRS patients. These findings support a transparent, clinically deployable decision-support approach for shared CRS surgical decision-making.

1:07 pm – 1:13 pm

GenAI utility in predicting sinus surgery outcomes in CRS

Vijay Ramakrishnan, MD, FARS

Indiana University School of Medicine

Introduction:

Chronic rhinosinusitis (CRS) patient experience heterogeneous outcomes after endoscopic sinus surgery (ESS). While generative AI (GenAI) models show promise in clinical reasoning, their

PROGRAM ABSTRACTS

role in structured outcome prediction remains unclear. We rigorously compared multiple GenAI systems with calibrated supervised machine learning (ML) to predict clinically meaningful improvement after ESS.

Methods:

Using a prospectively collected multicenter cohort of CRS patients undergoing ESS (n=524), we evaluated and benchmarked supervised ML models against multiple GenAI models (ChatGPT, Claude, Gemini, Perplexity) under a standardized tabular-to-GenAI protocol with constrained outputs and zero-shot prompting. Performance was assessed on a held-out test set using discrimination, calibration, and decision-curve net benefit. We further analyzed GenAI reasoning and performed subgroup analyses.

Results:

MLP performed best, with superior calibration and net clinical benefit. In contrast, GenAI models demonstrated weak discrimination (AUROC 0.36–0.63) and poor calibration, often defaulting to “treat-all” behavior. Notably, GenAI explanations consistently aligned with clinician heuristics and ML feature importance, emphasizing baseline SNOT-22, CT/endoscopy severity, polyp phenotype, and psychological/pain comorbidities.

Discussion:

Despite inferior predictive performance, GenAI demonstrated striking concordance with expert reasoning. GenAI offered transparent explanations, suggesting a complementary role for clinical decision support in an ML-first, GenAI-augmented paradigm for patient-facing education to enhance shared decision-making.

1:14 pm – 1:20 pm

Machine learning to predict response to appropriate medical therapy for chronic sinusitis

Waleed M. Abuzeid, MD, FARS

Ethan Sage

Arun Raghavan, MD

John-Paul Giliberto, Assistant Professor

Ian Humphreys, DO, FARS

Aria Jafari, MD, FARS

University of Washington

Background:

Appropriate medical therapy (AMT) fails to adequately treat about 30% of chronic rhinosinusitis (CRS) patients. This study

evaluates machine learning models (MLMs) in predicting response to AMT from pre-therapy variables.

Methods:

CRS patients (n=278) undergoing AMT were used to develop MLMs trained toward the primary endpoint of achievement of the minimal clinically important difference (MCID) (>12-point change in total SNOT-22 from pre- to post-therapy). Secondary endpoints were used for patients missing SNOT-22 data, with success defined as not being offered surgery and failure as being offered surgery with evidence of inflammation on post-therapy CT. Pre-therapy demographic and clinical predictors were included. Data were split 80:20 into training and testing sets. Two MLMs (XGBoost and Ensemble) and logistic regression (LR) were evaluated.

Results:

LR and XGBoost outperformed the Ensemble model. XGBoost, when compared to the Ensemble model and LR, achieved the highest specificity (95.7% vs 91.3% vs 91.3%, respectively) and accuracy (92.9% vs 80.4% vs 91.1%, respectively). LR achieved the highest sensitivity compared to XGBoost and Ensemble (90.0% vs 80.0% vs 30.0%, respectively). LR and XGBoost also demonstrated superior discrimination compared to Ensemble (AUC 0.959, 0.958, and 0.884, respectively).

Conclusion:

MLMs based on pre-therapy data demonstrated strong performance in predicting AMT response in CRS, with discriminative ability comparable to LR. Our results suggest a composite approach—using high-sensitivity LR to screen for likely AMT responders followed by high-specificity XGBoost to confirm AMT response—can triage likely AMT failures toward ESS.

PROGRAM ABSTRACTS

1:21 pm – 1:27 pm

Machine learning detection of acute sinusitis from nasal endoscopy video

Akshay Prabhakar, BSA
Aakash Agarwal, MS
Justina R. Varghese, BA
Linda Liu, BS
Claire Qu, BS
Yixuan Zheng, Dr.
Renjie Hu, PhD
Edward D. McCoul, MD, FARS
Masayoshi Takashima, MD, FARS
Omar Ahmed, MD, FARS
Houston Methodist Hospital

Introduction:

Machine learning (ML) applied to endoscopic video may offer a scalable, objective approach to identifying infectious findings that could support clinical decision-making for acute sinusitis.

Methods:

We developed a two-stage ML pipeline to classify nasal endoscopic videos as “Sinusitis” or “Control”. Patients with acute sinusitis were identified at a single academic center based on clinical diagnosis supported by endoscopy. Controls were patients without sinonasal infection. 168 videos (87 control, 81 sinusitis) were divided into a training set (n=116) and test set (n=52). Videos underwent temporal frame sampling with increased density toward diagnostically relevant portions. Frames were contrast-enhanced and normalized. A pretrained convolutional neural network extracted deep visual features from representative keyframes, which were aggregated into a single feature vector per video. Multiple classifiers were trained and compared using leave-one-out cross-validation. The performance of the best model was evaluated on the test set.

Results:

The final model achieved a cross-validation AUC of 0.892 and accuracy of 83.6% on the training set of videos. On the test set, the model achieved an AUC of 0.933 and overall accuracy of 82.6%, correctly classifying 23/27 as “Control” and 22/25 as “Sinusitis” (sensitivity 0.880, specificity 0.778).

Conclusion:

Our ML pipeline demonstrated strong performance in distinguishing sinusitis from non-infectious controls, representing one of the first AI models trained on endoscopic videos for rhinologic diagnosis. With further validation and expanded datasets, this approach may support

standardized sinusitis detection across clinical settings, including those with limited specialist access.

1:28 pm – 1:34 pm

Multimodal deep learning for differentiating sinonasal tumors using endoscopy and MRI

Xinyan Cui, MD, PhD
Kenan Ye
LiritcLevi, MD
Mahdokht Sadat Manavi, MD
Peter Moon, Resident Physician
Peter Hwang, MD, FARS
Noel Ayoub, MD, MBA
Zara Patel, MD, FARS
Michael Chang, MD
Stanford University

Background:

Preoperative differentiation of sinonasal tumors is critical for clinical management. Deep learning models using endoscopic or radiologic imaging have shown promise; integrating both modalities may further improve diagnostic performance. We developed a multimodal deep learning model combining endoscopy and MRI to differentiate benign and malignant sinonasal tumors.

Methods:

Patients with pathology-confirmed sinonasal tumors treated at Stanford (2013–2025) were included. Images were annotated by 3 independent otolaryngologists. A multimodal fusion model combined a MedSigLIP encoder and MRI-CORE encoder via cross-attention decoder and was compared to single-modality models. Data were split into training, validation, and testing sets (3:1:1). AUC and Grad-CAM analyses were performed.

Results:

1,192 endoscopic and MRI images from 112 patients (56 benign and 56 malignant tumors) were used for model training. In model testing, the endoscopy-only model achieved an accuracy of 0.68, precision of 0.64, recall of 0.82, AUC of 0.76, F1-score of 0.72, while the MRI-only model achieved an accuracy of 0.68, precision of 0.83, recall of 0.46, AUC of 0.68, and F1-score of 0.59. The multimodal fusion model showed the strongest performance over both single-modality models, with accuracy of 0.82, AUC of 0.75, precision of 0.82, recall of 0.82, F1-score of 0.82. Grad-CAM analysis demonstrated attention localizing to pathology within the sinonasal cavity.

PROGRAM ABSTRACTS

Conclusions:

Multimodal integration of nasal endoscopy and MRI in a deep learning model improved diagnostic performance over single-modality models for differentiating sinonasal tumors. This fusion approach provides a foundation for future multimodal diagnostic deep learning models.

1:35 pm – 1:40 pm

Q&A

1:40 pm – 2:10 pm

PANEL: “PNN Ablation: Game Changer or Current Trend?”

Moderator: Douglas Reh, MD, FARS

Panelists: Karen Bednarski, MD; Chris Davis, MD, FARS; Anthony Del Signore, MD, FARS

Session Moderators: Omar Ahmed, MD, FARS; Katie Phillips, MD, FARS

2:11 pm – 2:17 pm

NSAID vs opioid analgesia after sinonasal surgery: A randomized controlled trial

Grace Cheung, Medical Student

Patrick MacInnis, Research Coordinator

Connor Brenna, Resident Physician

Yvonne Chan, MD, FRCSC, MSc, FARS

Molly Zirkle, Associate Professor

John Lee, MD MSc, FRCSC

Daniel Lee, MD, FRCSC

University of Toronto

Background:

Prescription opioids are widely used for postoperative pain after sinonasal surgery but carry risks such as respiratory depression, nausea, vomiting, and persistent use. NSAIDs effectively reduce pain and opioid needs, yet their use has been limited by concerns regarding bleeding and impaired mucosal healing.

Methods:

This ongoing randomized controlled non-inferiority trial is enrolling 108 adults undergoing endoscopic sinus surgery, septoplasty, or septorhinoplasty. Participants receive acetaminophen 1000mg PO Q6H for 3 days (then PRN) and either (1) celecoxib 400mg PO once then 200mg BID for 2 days, with oxycodone 5mg PO Q4–6H PRN as rescue (NSAID arm); or (2) oxycodone 5mg PO Q4–6H PRN alone (opioid-only arm). Primary outcome is pain severity and interference via the Brief Pain Inventory on POD3. Secondary outcomes include pain scales POD1–30, adverse events, rescue opioid use, and quality of recovery

(QoR-15).

Results:

Interim analysis of 102 participants demonstrated no significant differences between groups in POD3 pain severity (median 1.625 vs 2.750; $p=0.1816$) or pain interference (median 1.833 vs 3.000; $p=0.3196$) for NSAID and opioid groups, respectively. Mixed-effects analyses showed significant changes in pain over time ($p<0.0001$) but no differences between treatment groups or group–time interactions. Adverse events, including epistaxis, nausea, vomiting, dizziness, and headache did not differ significantly between groups.

Conclusion:

Interim findings support the non-inferiority of a celecoxib-based NSAID regimen for postoperative pain control after sinonasal surgery. Final results will inform whether NSAIDs can be safely integrated into discharge protocols after sinonasal surgery to reduce opioid exposure.

2:18 pm – 2:24 pm

Reducing particulate in endoscopic drilling: An evaluation of a novel nasopharyngeal suction system

Corinne Stonebraker, BA

Megan Christy, BSE

Abdelrahman Ahmed, MS

A. Michael Ierardi, MES, MS, CIH

Tyree Williams, PhD

Turner Baker, PhD

Lacy Brame, DO

Brian Pavilonis, PhD, CIH

Alfred-Marc Ilorete, MD

Background:

Endoscopic skull base drilling generates aerosolized fine particulate matter (PM), which can obscure visualization and expose surgeons and operating room staff to harmful particles. Here we present an occlusive nasopharyngeal suction prototype (NSP) to hermetically seal the nasopharynx and provide continuous evacuation in a standardized endoscopic skull base drilling model to improve visualization and reduce aerosolized PM exposure.

Methods:

A 3D-printed endonasal model with posterior septectomy and sphenoidotomy incorporated an egg-based drilling interface to simulate the bone-dura interface. The model was positioned in

PROGRAM ABSTRACTS

surgical orientation and connected to an NSP suction circuit (100 mmHg). Checkerboard targets enabled quantitative visibility assessment via Sobel edge detection with bandpass filtering. Real-time particulate concentrations were recorded at one-second intervals in the operator breathing zone (SidePak™ AM520) and operative field (DustTrak™ DRX). Aerosolized PM exposure and visibility during drilling with NSP use were compared to a control without suction.

Results:

Mean total PM concentrations near the operative field were 99.7% lower with NSP than control ($p < 0.05$). Mean PM_{2.5} concentrations near the operator breathing zone were 70.7% lower with NSP than control ($p < 0.05$). Mean minimum visibility was significantly higher with NSP (92.7%) than control (67.2%; $p = 0.01$).

Conclusion:

The NSP significantly reduced aerosolized PM concentrations and enhanced visualization in simulated endoscopic skull base drilling. These findings support further testing of the NSP as a practical approach to optimize intraoperative safety and visibility.

2:25 pm – 2:31 pm

Topical vasoconstrictor injection and bleeding in endoscopic sinus surgery: A randomized trial

Amin Javer, MD, FARS
Azin Tabari, MD

Background:

Endoscopic sinus surgery (ESS) is widely used for chronic rhinosinusitis (CRS) and other sinonasal conditions. Intraoperative bleeding remains a major challenge, affecting visualization and operative efficiency.

Objective:

To evaluate whether submucosal injection of 0.25% bupivacaine with epinephrine reduces intraoperative bleeding, blood loss, and operative time compared to sham injection during ESS.

Methods:

This interim analysis includes 47 of 80 planned patients randomized to receive either bupivacaine with epinephrine or sham injection during ESS. The primary outcome was intraoperative bleeding using the Boezaart score, assessed separately for septoplasty and sinus surgery. Secondary

outcomes included mean arterial pressure (MAP), total blood loss, operative time, and postoperative pain. Owing to limited sample size, results are reported descriptively without formal hypothesis testing.

Results:

Among 47 patients (23 Injection, 24 Sham), median Boezaart scores were lower in the Injection group for the septum (1.0 [IQR 0] vs 2.1 [1.1]) and sinus region (1.8 [1.06] vs 2.25 [0.46]). MAP was similar between groups. Mean blood loss was lower in the Injection group (125 ± 51 mL) compared to Sham (365 ± 144 mL). Operative time was comparable (131.7 ± 41.4 vs 139.4 ± 39.8 minutes). Postoperative pain scores were similar across time points. Final analyses will include the full sample and apply conventional hypothesis testing thresholds ($p < 0.05$).

Conclusions:

Submucosal bupivacaine with epinephrine may reduce intraoperative bleeding and blood loss without affecting operative time, MAP, or pain. Final analysis with the full sample will determine statistical significance.

2:32 pm – 2:38 pm

Comparing postoperative CSF leak outcomes between two free mucosal graft harvest sites

Julia Canick, MD
Saad Ahmed
Srikanth Ganapathiraju
Ashley Feng
Emmanuel Garcia Morales
Christopher Jabbour, MD
Carlos Pinheiro-Neto, MD, PhD

Introduction:

CSF leak is a common complication after endonasal surgery with sellar reconstruction. The nasoseptal flap (NSF) can reduce rates of postoperative CSF leaks; however, this can be associated with donor site morbidity due to exposed cartilage on the nasal septum after flap harvest. A free mucosal graft (FMG) for sellar reconstruction has improved morbidity while still protecting against CSF leaks; this can be harvested from either the middle turbinate or the nasal floor. This study compares outcomes of FMG use between the two sites after pituitary resection.

Methods:

A retrospective chart review was performed for

PROGRAM ABSTRACTS

patients who underwent endoscopic endonasal resection of pituitary adenomas at the Mayo Clinic and Albany Medical Center. The following data were collected: demographics, tumor dimension, intraoperative leak and flow, postoperative leak, and other complications. Statistical analysis was performed with a robust Poisson distribution, adjusted based on graft source, age, sex, BMI, and tumor size.

Results:

Charts of 401 patients who underwent reconstruction using an FMG from the middle turbinate or the nasal floor were reviewed. There was a 1% postoperative CSF leak rate in patients with middle turbinate FMG reconstruction (n = 1 out of 102), and a 0.3% leak rate in patients with nasal floor FMG reconstruction (n = 1 out of 299). Compared to the nasal floor FMG, the prevalence ratio of CSF leak was 23.56 for the middle turbinate FMG (p = 0.009).

Conclusion:

The FMG is a simple and effective means of sellar reconstruction, with a low CSF leak rate and an improved morbidity profile compared with that of the NSF. The repair provided by the nasal floor FMG is significantly superior to that of the middle turbinate.

2:40 pm – 2:45 pm

Q&A

2:45 pm – 3:15 pm

Break with Exhibitors in Regency

Session Moderators: Nyssa Farrell, MD; Michael Marino, MD, FARS

3:15 pm – 3:21 pm

Tezepelumab improves sinonasal outcomes in adults with CRSwNP with a history of prior NP surgery

Stella Lee, MD, FARS

Anju Peters, MD

Joseph Han, MD, FARS

Eugenio De Corso, Professor

Martin Desrosiers, Clinical Professor

Claire Hopkins, Professor

Oliver Pfaar

Martin Wagenmann, Prof.

Claudio Marchese

Sonia Shenoy

Christopher Ambrose, Franchise Head, US Medical

Background:

Tezepelumab significantly reduced nasal polyp (NP) size, nasal congestion (NC) and the need for NP surgery or systemic corticosteroids, and improved sinonasal symptoms versus placebo in adults with uncontrolled chronic rhinosinusitis with nasal polyps (CRSwNP) in WAYPOINT (NCT04851964). This WAYPOINT analysis evaluated the impact of time since prior NP surgery on sinonasal outcomes.

Methods:

The changes from baseline to week 52 in the total NP score (NPS) and biweekly mean NC score (NCS) in patients grouped by time since prior NP surgery (<3, ≥3 to <5, ≥5 to <10 and ≥10 years) were assessed.

Results:

In patients receiving tezepelumab (n=144) or placebo (n=147), significant improvements in NPS and NCS at week 52 were observed in tezepelumab versus placebo recipients in all prior NP surgery groups (all nominal p<0.0001). The greatest improvements in NPS and NCS with tezepelumab were observed in patients with fewer years since last NP surgery: NPS (least-squares mean [LSM] difference vs placebo [95% CI]: <3 years, -2.98 [-3.80, -2.15]; ≥3 to <5 years, -2.44 [-3.38, -1.49]; ≥5 to <10 years, -2.07 [-2.69, -1.45]; ≥10 years, -1.76 [-2.54, -0.98]); NCS (LSM difference vs placebo [95% CI]: <3 years, -1.65 [-2.08, -1.22]; ≥3 to <5 years, -1.36 [-1.86, -0.87]; ≥5 to <10 years, -1.03 [-1.36, -0.71]; ≥10 years, -0.80 [-1.21, -0.39]). Similar trends were observed for smell outcomes, Lund-Mackay and SNOT-22 total scores.

Conclusion:

Tezepelumab improved sinonasal outcomes across all prior NP surgery subgroups, with the greatest numerical improvements seen in those with fewer years since last NP surgery. This subgroup may have a high disease burden, which could be driving disease recurrence and treatment effects with tezepelumab.

PROGRAM ABSTRACTS

3:22 pm – 3:28 pm

Real-world comparison of Dupilumab and Mepolizumab in CRSwNP

Stella Lee, MD, FARS

Kathleen M. Buchheit

Duane Madziva

Michelle Baglia, Dr.

Aakash Bipin Gandhi, Dr.

Ryan B. Thomas, Dr.

Sabrina Solouki, Dr.

Scott Nash, Dr.

Tayin Kamal

Joshua Levy, MD

Background:

This retrospective study evaluated prescription fills (oral corticosteroids [OCS], intranasal corticosteroids [INCS], and oral antibiotics), exacerbations (chronic rhinosinusitis with nasal polyps [CRSwNP] and asthma-related), and functional endoscopic sinus surgery (FESS) in patients with CRSwNP initiating dupilumab versus mepolizumab.

Methods:

The Inovalon Real-World Data US administrative claims database was used to identify adult CRSwNP patients initiating dupilumab or mepolizumab between July 2021–December 2023 (index date), with ≥ 365 days of continuous insurance enrollment before and after treatment initiation. Patients with prior biologic use in 365-day baseline were excluded. Following 1:3 propensity-score matching, outcomes were reported as incidence rate ratio (IRR) or odds ratio (OR) with 95% confidence interval (CI). Sensitivity analysis accounted for treatment persistence differences.

Results:

After matching, 494 mepolizumab and 1,482 dupilumab patients were included. Dupilumab was associated with significantly lower rates (all $p < 0.01$) of OCS fills (30% reduction; IRR [95% CI]: 0.70 [0.62–0.80]), INCS fills (24%; 0.76 [0.64–0.89]), oral antibiotic fills (21%; 0.79 [0.70–0.90]), CRSwNP exacerbations (34%; 0.66 [0.52–0.83]), asthma exacerbations (31%; 0.69 [0.57–0.85]), and lower odds of FESS (OR [95% CI]: 0.61 [0.43–0.85]) compared to mepolizumab. Sensitivity analysis confirmed these findings.

Conclusion:

Dupilumab was associated with significant reductions in steroid and antibiotic use, exacerbations, and surgery burden compared to

mepolizumab. Study limitations include residual confounding from unmeasured disease severity. Future prospective studies are needed to confirm these findings.

3:29 pm – 3:35 pm

Topical antibiotic irrigation efficacy in refractory chronic sinusitis

Kevin L. Li, MD

James Widner, BS

Tran Locke, MD, FARS

Meha Fox, MD, FARS

Introduction:

Chronic rhinosinusitis is a prevalent condition requiring multimodal management. For refractory disease, topical antibiotic irrigation is a beneficial adjunct, though current evidence is limited. Current guidelines reserve culture-directed therapy for select cases. We provide evidence on topical antibiotic irrigation efficacy in a large single-center cohort.

Methods:

This is a retrospective cohort study of patients with refractory chronic rhinosinusitis with (CRSwNP) or without nasal polyps (CRSsNP), treated with culture-directed topical antibiotic irrigation. Pre- and post-treatment SNOT-22 scores and endoscopic evidence of purulence were compared. Normality was assessed using the Shapiro-Wilk test. Paired t-tests or Wilcoxon signed-rank tests were applied accordingly. Purulence on endoscopy was compared using McNemar's test.

Results:

99 patients with 104 incidences of treatment were included. Mean SNOT-22 scores improved significantly following topical antibiotic irrigation (32.8 ± 21.3 vs 24.9 ± 19.2 , $p < 0.001$) as did rhinologic subdomain scores (19.0 ± 11.4 vs 14.0 ± 10.7 , $p < 0.001$). Purulence resolved in 54% of patients (38/71, $p < 0.001$). On subgroup analysis, 63% of CRSwNP and 58% of CRSsNP patients saw resolution of purulence and both groups saw significant reduction in mean SNOT-22 scores ($p = 0.003$ and $p < 0.001$, respectively). A significant correlation was identified between SNOT-22 improvement and purulence resolution ($r = -0.37$, $p = 0.002$).

Conclusions:

Topical antibiotic irrigation statistically improved SNOT-22 scores in both CRSwNP and CRSsNP patients. These findings support topical antibiotic

PROGRAM ABSTRACTS

irrigation as an effective adjunct for refractory disease.

3:36 pm – 3:42 pm

The Dupilumab divide: Sociodemographic disparities in biologic access for CRSwNP

Lisa Chionis Buhler, MD
Varada Sarovar, PhD
Jane W. Liang, PhD
Alexandra N. Lea, MPH
Michael J. Silverberg, PhD, MPH
Jonathan Liang, MD, MPH

Background:

Dupilumab has transformed CRSwNP management yet remains costly and infrequently utilized. Sociodemographic factors associated with its use in CRSwNP patients are insufficiently described.

Methods: This retrospective case-control study in an integrated care system included adult eosinophilic CRSwNP patients with prior endoscopic sinus surgery. Cases received ≥ 1 dose of dupilumab 300 mg between June 2019 through December 2024; controls did not. Bivariate analyses compared sociodemographic characteristics.

Results:

Of 6,387 patients, 479 (7.5%) received dupilumab. Cases were younger (median 48.1 vs. 54.5 years; $p < 0.01$). Insurance differed ($p < 0.01$), with cases having higher commercial coverage (81.0% vs. 70.9%) and lower Medicare enrollment (11.7% vs. 24.8%). Race/ethnicity differed ($p < 0.01$): Black (13.4% vs. 6.7%) and Asian (16.1% vs. 15.1%) patients comprised a higher proportion of cases, while White (53.0% vs. 59.7%) and Hispanic (12.7% vs. 14.4%) patients showed a lower proportion. Usage was associated with rhinologist access (75.2% vs. 68.9%), asthma (76.2% vs. 37.7%), aspirin sensitivity (1.7% vs. 0.3%), and NSAID allergy (6.9% vs. 2.3%; all $p < 0.01$). Neighborhood deprivation index, sex, atopic dermatitis, and smoking did not differ.

Conclusions:

Dupilumab use is concentrated among younger, commercially insured patients with rhinology subspecialist access. Unlike other biologic cohorts, Black and Asian patients showed proportionally higher dupilumab use in CRSwNP, potentially reflecting greater disease severity, asthma comorbidity, or geographic concentration

near subspecialty hubs. Further studies are needed to characterize sociodemographic disparities and mitigate disparities with CRSwNP biologics.

3:43 pm – 3:47 pm

Q&A

3:48 pm – 4:25 pm

PANEL: “Olfactory Dysfunction: Where We Are and What Do We Actually Have to Offer?”

Moderator: Zara Patel, MD, FARS
Panelists: Nyssa Farrell, MD; Eric Holbrook, MD, FARS; Lo Ren Hui, MBBS; Carol Yan, MD

Session Moderators: Mathew Geltzeiler, MD, FARS; Carol Yan, MD

4:26 pm – 4:32 pm

Oral antibiotic efficacy for persistent odontogenic sinusitis following dental extraction

Benjamin Wils, MD, MS
Marta Kwiatkowska, Dr.
Nikita Chapurin, MD
Jun Jin, Assistant Scientist in Biostatistics
Alberto Maria Saibene, Dr.
John Craig, MD, FARS
Henry Ford Health

Background:

Dental treatment with or without endoscopic sinus surgery (ESS) resolves over 90% of odontogenic sinusitis (ODS). While ODS caused by dental infection requires dental treatment, oral antibiotic utility for persistent ODS after dental extraction remains incompletely studied. This study evaluated antibiotic efficacy for persistent ODS following extraction.

Methods:

A multicenter prospective cohort study enrolled adults from May 2023–July 2025, with ODS from endodontic infection or extraction, whose sinusitis persisted more than two months following extraction. At first rhinologic visits, symptom durations, SNOT-22, CT, and middle meatal endoscopy findings were recorded. Patients were then prescribed 14 days of oral amoxicillin-clavulanate. Clinical outcomes were reassessed two months later. If purulence resolved at second visits, they were seen 2-3 months later. If purulence persisted at second visits, or recurred at third visits, ESS was offered, and patients were followed for disease resolution.

PROGRAM ABSTRACTS

Results:

Of 40 patients, mean age was 54.6 years, and 60% were male. Patients had a mean 1.6 antibiotic courses (16.6 days/patient) prior to first visits. After 14-day amoxicillin-clavulanate courses, 57.5% reported transient improvement; however, 92.5% remained symptomatic at second visits, with symptom recurrence at mean 7.3 days. Ultimately, 12.5% achieved resolution with antibiotics alone. Of the 35 unresolved patients, 28 underwent ESS; 92.9% resolved after primary ESS, and 100% after revision ESS.

Conclusion:

Oral antibiotics rarely resolved persistent ODS after extraction. Considering ESS's high success for ODS without treatable dental sources, earlier ESS should be considered rather than repeated antibiotics.

4:33 pm – 4:39 pm

21-year institutional review of stentless endoscopic dacryocystorhinostomy

Ren Hui Lo, MBBS, MMED ORL-HNS

Harvinder Singh

Dalip Singh, Consultant Rhinologist

Pathma Letchumanan, Consultant Rhinologist

Background & Aim:

Dacryocystorhinostomy (DCR) is traditionally performed via either an external or endoscopic approach, with or without stent. While surgical techniques vary globally, our center in Malaysia has been performing stentless endoscopic approach for the management of nasolacrimal duct obstruction and chronic dacryocystitis. This presentation reviews our 21-year surgical experience, detailing our standardized operative technique and evaluating long-term clinical outcomes and success rates.

Material & Methods:

We present this retrospective study evaluating all 238 endoscopic stentless DCR procedures performed over two decades (2005–2025). The series includes 112 right-sided, 102 left-sided, and 24 bilateral cases. Our analysis focuses on clinical indications, success rates, and the primary drivers of surgical failure. By examining 21 years of longitudinal data, we provide evidence-based insights into the efficacy of the endoscopic stentless approach.

Results:

The primary surgical success rate was 96.21%

(n=229), demonstrating clinical outcomes comparable to established benchmarks for both external (open) dacryocystorhinostomy and endoscopic techniques utilizing nasolacrimal stenting. Postoperative failure was limited mainly due to recurrent infections; nine patients (3.78%) required a primary revision procedure, while two patients (0.84%) necessitated a secondary revision to achieve functional patency.

Conclusions:

Our two-decade experience suggests that the stentless endoscopic approach is a highly effective, minimally invasive alternative that yields success rates on par with traditional stented or open methods, while reducing stent-related morbidity.

4:40 pm – 4:46 pm

Anterior ethmoidal artery flap outcomes for nasal septal perforation repair

Pedro S. Bonilla, MSc

John Craig, MD, FARS

Lane Donaldson

Rehab Simsim

Nick Teller

Obadah Tolaymat, Medical Student

Leigh Sowerby, MD

Chadi Makary, MD, FARS

Carl Wilson, MS

Robert Deeb

Background:

The anterior ethmoidal artery (AEA) flap has demonstrated high success for nasal septal perforations (NSP) closure. Most studies on success have been limited by small samples, relatively short follow-up duration, and lack of symptom reporting. This study aimed to determine early and long-term technical and symptomatic success of NSP closure with the AEA flap.

Methods:

A multicenter retrospective cohort study was conducted on all patients who underwent at least a unilateral AEA flap with or without interposition grafts and/or mucosal turn-in flaps for contralateral coverage. Primary outcome measures were NSP closure rate, time to NSP reformation, and whether patients were happy they underwent NSP repairs. Demographics, comorbidities, symptoms, NSP etiology and size, and surgical techniques were compared between reoperations that were early (<6 months) versus late (>6 months).

PROGRAM ABSTRACTS

Results:

Of 121 patients, mean age was 42.7 years, and 71.1% were female. NSPs were most commonly idiopathic (35.5%) or from surgical trauma (30.6%). Mean NSP area was 1.7 cm². Mean follow-up duration was 2.3 years (range= 1-7.4 years). NSP closure rate was 90.9% (110/121) at 6 months postoperatively. However, ultimate NSP closure rate was 68.6% (83/121), with 50% of reoperations occurring after 1 year postoperatively (19/38). Overall mean time to reoperation was 7.9 months postoperatively. Notably, 89.3% (108/121) were happy they underwent NSP repair.

Conclusion:

While NSP closure success was 91% at 6 months postoperatively, success dropped to about 70%, with most late failures occurring after 1 year postoperatively. Overall, about 90% of patients were happy they underwent NSP repair.

4:47 pm – 4:53 pm

Return-to-OR outcomes in HHT

Mishek Thapa, BS

Shady I. Soliman, MD

Albert Li, BA

Tyler Jun, BS

Rory Lubner, MD

Daniel Beswick, MD, FARS

Jivianne Lee, MD, FARS

Jeffrey Suh, MD, FARS

Marilene B. Wang, MD, FARS

UCLA

Background:

Epistaxis in hereditary hemorrhagic telangiectasia(HHT) is recurrent and often requires medical and surgical intervention. Tranexamic acid(TXA) and bevacizumab(Bev) are widely used, but their influence on return-to-OR rates and healthcare utilization remain poorly defined.

Methods:

We identified 798 HHT patients with >2 epistaxis-related surgeries using TriNetX. Of these, 235 initiated TXA, 78 Bev, and 75 Bev+TXA after prior epistaxis surgery; 491 received neither. Cox regression adjusted for demographics, disease severity using hematologic complications (Hgb level, blood, iron transfusion, hospitalizations), and comorbidities (diabetes, hypertension). Outcomes were measured at 1- 3 years following medication initiation.

Results:

Use of TXA and Bev increased over the study period. Compared to control, TXA, Bev, and Bev+TXA were each associated with reduced risk of repeat surgery(HR 0.56, HR 0.646, HR 0.491, respectively). Among patients requiring reoperation, TXA and BEV groups had fewer repeat procedures(0.9, 0.8 vs 1.3 control) and longer time to reoperation(228, 235 vs 204 control). Longer duration of TXA use was associated with fewer repeat procedures and longer time to reoperation(all p <0.05). Hematologic outcomes, including Hgb level and transfusion rates, and coagulation-related outcomes did not significantly differ in TXA and Bev+TXA groups compared to control. Both groups were associated with reduced ED visits and ICU admissions.

Conclusion:

TXA and Bev+TXA were associated with reduced procedural burden, fewer repeat surgeries, and longer intervals between interventions, without adverse hematologic or coagulation outcomes. These findings support their use in reducing operative need for epistaxis control.

4:54 pm – 5:00 pm

Q&A

5:00 pm – 6:30 pm

RAPPers Event

Room: Cordoban, Mezzanine Level

5:00 pm – 6:30 pm

Poster Mentorship Session

“The Future of Rhinology, One Poster at a Time: Pearls from the Pros”

Room: Regency

Moderator: Christopher Roxbury, MD, FARS

The American Rhinologic Society is pleased to introduce the Poster Mentorship Session. This new event will bring trainee poster presenters together with experienced rhinologists in small-group discussions led by ARS member mentors. Trainees will present their research, receive personalized feedback, and connect with peers and faculty in a collaborative environment that promotes mentorship, professional development, and networking. The reception reflects the ARS commitment to education, scholarship, and the development of future leaders in rhinology. We look forward to welcoming trainees, mentors, and members to this exciting event.

PROGRAM ABSTRACTS

5:30 pm – 6:30 pm

Fellows Subgroup Forum Event

Rendezvous Court

6:30 pm – 9:00 pm

President's Reception

Room: Crystal, Lobby Level

Friday, October 16, 2026

Breakout Room B

Emerald Room

1:00 pm – 5:00 pm

Room Moderator: Raj Sindwani, MD, FARS

Session Moderators: Michael Kohanski, MD, FARS; Arthur Wu, MD, FARS

1:00 pm – 1:06 pm

Immunological characterization of sinonasal tissue

Phillip Richards, MD

Devika Suja

Ashoke Khanwalkar, MD, FARS

Jenna Guthmiller

Lena Hansen

Elizabeth Gilliland

Alyssa Monterroso

University of Colorado

Objective:

Although the nose is the site of entry for many pathogens, and chronic rhinosinusitis (CRS) is characterized by persistent mucosal inflammation, the immune architecture of the human nasal cavity remains poorly defined. Recent histological data support the formation of tertiary lymphoid structures in nasal tissue of CRS patients. This study aims to further characterize local immune cell populations in sinonasal tissue and to investigate whether CRS is associated with distinct mucosal immune features.

Methods:

Adult sinonasal tissue was obtained during endoscopic sinus surgery, with IRB approval. Samples were analyzed with a 23 marker flow cytometry panel. Cells were subdivided into memory B cells (MBCs), activated B cells, and antibody-secreting cells (ASCs) based on CD38 and CD27 expression. Antibody isotypes, HLA-DR, CD21, CD31/PECAM, and CD103 were

examined, among other markers.

Results:

12 specimens were included, with 9 CRS (6 CRSsNP, 3 CRSwNP) and 3 healthy controls. MBCs were the dominant sinonasal B-cell population, comprising roughly 43%-94% of CD19+ cells, whereas activated B cells and ASCs were generally lower fractions. An IgD single-positive subset was identified within a substantial portion of the MBC compartment. High PECAM-1 positivity was common across B-cell subsets. Further analysis will target detecting differences between CRS and healthy subsets.

Conclusions:

Flow cytometric immunophenotyping of human sinonasal tissue is feasible and reveals a B-cell compartment enriched for MBCs, a reproducible IgD memory population, and broad PECAM/CD31 B-cell expression. These preliminary findings support deeper analysis of local B-cell organization in CRS and ideally future correlation with clinical phenotype.

1:07 pm – 1:13 pm

Single-cell analysis of AR+ tonsillar hypertrophy reveals altered germinal center responses

Won Jun Noh, MD

Sojung Choi

Hyun Je Kim

Doo Hee Han

Seoul National University Hospital

Tonsillar hypertrophy is a common condition frequently associated with allergic rhinitis (AR), yet their relationship remains controversial. While some studies report a positive correlation between the two conditions, others have reported the opposite, indicating that the underlying immunological mechanisms are not fully understood. Given the anatomical separation between the nasal cavity and palatine tonsils, it remains unclear whether allergic inflammation directly affects tonsillar immune responses. Here, we performed single-cell RNA sequencing and cell-cell communication analysis of hypertrophic tonsils from AR+ (n=9) and AR- (n=5) individuals to characterize immune cell states and intercellular networks. AR+ tonsils exhibited enhanced interactions among follicular helper T (Tfh) cells, B cells, and dendritic cells, particularly involving a LAG3⁺ germinal center (GC) Tfh subset. This was accompanied by increased

PROGRAM ABSTRACTS

CD40-responsive activation programs in light-zone B cells, consistent with enhanced Tfh-mediated help. B cell receptor analysis revealed an increased proportion of IgA1-expressing B cells in AR+ tonsils, suggesting enhanced class-switching and differentiation toward an IgA1-biased mucosal humoral response. Collectively, these findings indicate that AR is associated with functional remodeling of tonsillar germinal center responses, characterized by enhanced GC Tfh–B cell interactions and sustained antigen-driven humoral activity, rather than simple inflammatory enlargement, providing a potential immunological basis linking AR to tonsillar hypertrophy.

1:14 pm – 1:20 pm

Rituximab initiation timing and otolaryngologic outcomes in GPA

Ismail Khaderi, BS
Nathan Barefoot, BS
Priya Desai, BS
Elena Quinonez Del Cid, BS
Katrina Bootes, BS
Charles Ebert, MD, FARS
Brian Thorp, MD, FARS
Brent Senior, MD, FARS
Adam Kimple, MD, PhD, FARS
University of North Carolina School of Medicine

Background:

Rituximab is recommended for remission induction in granulomatosis with polyangiitis (GPA), and guidelines emphasize prompt initiation after diagnosis. However, no studies have directly evaluated whether the timing of rituximab initiation affects long-term otolaryngologic outcomes.

Methods:

We performed a retrospective cohort study using the TriNetX Research Network. Adults with newly diagnosed GPA were identified, and rituximab initiation was categorized as early (<2 weeks) or delayed (2–26 weeks). Patients were propensity score matched 1:1 on age, sex, race, and BMI. Five-year incident ENT outcomes included saddle nose deformity, septal perforation, subglottic stenosis, hearing loss, and chronic rhinosinusitis (CRS). Sub-analyses compared <2 weeks with 2–6, 6–12, and 12–26 weeks.

Results:

In the primary comparison (<2 weeks, n=1,361; 2–26 weeks, n=1,340), delayed initiation was associated with higher risk of saddle nose deformity (RR 1.61, p=0.047), subglottic stenosis

(RR 2.14, p=0.001), hearing loss (RR 1.53, p=0.001), and CRS (RR 1.74, p<0.0001). In sub-analyses, initiation at 2–6 weeks was associated with increased hearing loss (RR 1.59, p=0.008) and CRS (RR 1.44, p=0.008). Compared with 12–26 weeks, early initiation was associated with lower CRS risk (RR 1.80, p=0.0004) and a trend toward lower saddle nose deformity (RR 2.01, p=0.059).

Conclusions:

Delayed rituximab initiation after GPA diagnosis is associated with increased risk of long-term ENT complications, particularly subglottic stenosis, hearing loss, and CRS. These findings support prompt initiation of rituximab to mitigate irreversible otolaryngologic morbidity.

1:21 pm – 1:27 pm

PM2.5 and acute rhinosinusitis incidence

Yen Ting Lu, MD, PhD
Peter Hwang, MD, FARS
Chung Han Hsin, Chair
Shun Fa Yang, Professor and Chair
Jing Yang Huang, Assistant Professor
Yang Chou Juan
Ting Yi Lin
Chang Hung Shih
Po Yuan Chu
Yi Chung Chen, Professor

Background:

Fine particulate matter (PM2.5) is associated with respiratory disease, but whether its effect on acute rhinosinusitis differs across regions with different background pollution levels remains unclear. We examined the association between weekly PM2.5 concentration and acute rhinosinusitis incidence across distinct exposure clusters.

Methods:

We conducted a nationwide population-based study using the National Health Insurance Research Database from 2016 to 2019, including approximately 2 million individuals. Weekly township-level PM2.5 concentrations were estimated by inverse distance weighting and classified into 5 exposure clusters using K-means clustering. Multivariable regression models adjusted for age, sex, calendar year, and season were used to assess the association between PM2.5 and acute rhinosinusitis incidence.

Results:

PROGRAM ABSTRACTS

Higher weekly PM_{2.5} concentration was significantly associated with higher acute rhinosinusitis incidence overall (adjusted $\beta = 0.0131$ per 1 $\mu\text{g}/\text{m}^3$; 95% CI, 0.003-0.023; $P = .008$). The association varied across clusters, with a steeper slope in the lowest-background PM_{2.5} cluster (C5, $\beta = 0.106$) than in the most polluted cluster (C1, $\beta = 0.0632$). Cubic modeling suggested a possible nonlinear pattern and showed slightly better fit than the linear model (adjusted R^2 , 0.1412 vs 0.1281).

Conclusion:

Short-term PM_{2.5} exposure was associated with increased acute rhinosinusitis incidence. The association appeared stronger in lower-background exposure regions, suggesting geographic variation in PM_{2.5}-related risk.

1:28 pm – 1:34 pm

Structured histopathology of neutrophilic chronic rhinosinusitis

Harrison Poeszat

Nikki Yip

Daniel Ma, Medical Student

Thomas Cyberski, Resident Physician

Bobby Tajudeen, MD, FARS

Peter Filip, MD, FARS

Peter Papagiannopoulos, MD

Pete S. Batra, MD, FARS

Introduction:

Chronic Rhinosinusitis (CRS) is a highly inflammatory process with extensive literature on heterogeneous classifications; however, few studies have compared isolated neutrophilic CRS against a broader CRS cohort. We aim to understand how remodeling patterns vary between isolated neutrophilic CRS compared to a full CRS cohort and a neutrophilic/eosinophilic CRS cohort.

Methods:

Retrospective chart review was conducted on CRS patients who underwent functional endoscopic sinus surgery (FESS). Data was collected on SHP, demographics, comorbidities, neutrophil infiltrate, and eosinophil per high-power field (HPF). The cohort was divided into isolated neutrophilic versus all other CRS patients and isolated neutrophilic versus mixed neutrophilic/eosinophilic CRS.

Results:

67 isolated neutrophilic and 101 mixed neutrophilic/eosinophilic were included. 459 eosinophilic predominant CRS patients were included as controls. Compared to controls, isolated neutrophilic CRS had more subepithelial edema (77.3% vs 63.6%, $p=0.029$), mucosal ulceration (10.6% vs 3.5%, $p=0.008$), and squamous metaplasia (36.4% vs 22.0%, $p=0.010$). Compared to isolated neutrophilia, mixed CRS had more overall inflammation ($p=0.009$), basement membrane thickening (85.1% vs 71.4%, $p=0.029$), and fibrosis (53.0% vs 36.6%, $p=0.034$).

Conclusion:

Isolated neutrophilic CRS resulted in a distinct SHP profile, which may distinguish neutrophilic CRS as a unique endotype. The degradative remodeling in neutrophilia, contrasted with fibrosis in eosinophilia, may elucidate the pathophysiology of a neutrophilic subtype. Further understanding of the molecular milieu may inform management strategies for this recalcitrant neutrophilic CRS subtype.

1:35 pm – 1:40 pm

Q&A

Session Moderators: Kristine Smith, MD, FARS; Stephanie Smith, MD

1:41 pm – 1:47 pm

Neutrophilic inflammation and treatment burden in type 2 chronic rhinosinusitis with nasal polyps

Larry Wang, MS

Atsushi Kato, PhD

Junqin Bai, PhD

David Conley, MD, FARS

Robert Kern, MD, FARS

Robert Schleimer, PhD

Whitney Stevens, MD, PhD

Stephanie Smith, MD, FARS

Bruce Tan, MD

Kevin Welch, MD, FARS

Anju Peters, MD

Northwestern University

Background:

Chronic rhinosinusitis with nasal polyp (CRSwNP) is typically categorized into 3 inflammatory endotypes (T1, T2, and T3) according to T cell cytokine profiles. Molecular mechanisms have recently characterized a novel neutrophil-

PROGRAM ABSTRACTS

predominant variant (Vn). Due to a paucity of studies examining the clinical behavior of the Vn endotype, this study aims to assess the treatment burden of Vn-containing endotypes and compare it to the more conventional T2 endotype.

Methods:

We conducted a retrospective cohort analysis of 167 CRSwNP patients stratified by endotype. T1, T2, T3, and Vn endotypes were determined by mRNA expression of IFNG, IL13, IL17A, and FCGR3B, respectively using qRT-PCR. Clinical variables including need for revision sinus surgery and prescriptions for antibiotics, oral corticosteroids, and biologics within 5-years following index surgery were determined by manual chart review.

Results:

The majority of our cohort had a T1/T2 or T2 only endotype (n=129, 77%) while 15% were T2/Vn (n=25) and 8% were T2/T3/Vn endotypes (n=13). Compared to the T2 group (T1/T2 + T2 only), the Vn group (T2/Vn + T2/T3/Vn) cohort was more likely to receive antibiotics (65.8% vs 45.0%, p=0.028) and T2 biologics (18.4% vs 6.2%, p=0.046). Although not statistically significant, patients in the Vn group received higher rates of oral corticosteroids (65.8% vs 51.2%, p=0.14) and revision surgery (10.5% vs 3.9%, p=0.12). The Vn group had significantly greater oral corticosteroid burden, receiving more total courses than the T2 only endotype (mean, 2.5 vs 1.5 courses, p=0.041).

Conclusion:

The Vn group was associated with greater therapeutic needs compared to the T2 only endotype, indicating a more refractory disease subtype.

1:48 pm – 1:54 pm

Eosinophil peroxidase activity and protein show distinct associations in CRS inflammation

Christian Caceres, MD

Evan Marsh, Graduate Research Assistant

Kristine Smith, MD, FARS

Chelsea Pollard, Research Analyst

Fok Vun Chan, Research Scientist

Fatemeh Zarehajiabadi, Graduate Research Assistant

Benjamin Witt, Section Chief

Jeremiah Alt, MD, PhD, FARS

Gretchen Oakley, MD

Richard Orlandi, MD, FARS

Abigail Pulsipher, MD

University of Utah School of Medicine

Background:

Systemic biomarkers do not reliably reflect local inflammation or disease severity in eosinophil chronic rhinosinusitis (eCRS). Local eosinophil peroxidase (EPX) activity and protein correlate with biopsy-based diagnosis and disease severity, but their relationships to inflammatory pathways and cytokine profiles remain unclear. We sought to determine whether EPX activity and protein represent distinct aspects of eosinophilic inflammation and to evaluate their associations with local and systemic cytokines and disease severity in CRS.

Methods:

Adults undergoing endoscopic sinus surgery for refractory CRS were prospectively enrolled (n=33). eCRS was defined as ≥ 10 eosinophils per high-power field. Nasal swab EPX activity and protein, and local and systemic cytokines were quantified. Group comparisons used Mann-Whitney U tests, and associations were assessed by Spearman correlation (p<0.05).

Results:

EPX activity differed between eCRS and non-eCRS (p=0.0406), whereas EPX protein did not (p=0.3966). Both EPX activity (rs=0.391, p=0.024) and protein (rs=0.488, p=0.004) correlated with histologic eosinophil counts but not with each other. EPX activity correlated with Lund-Kennedy (rs=0.494, p=0.004) and Lund-Mackay (rs=0.368, p=0.046) scores. EPX protein correlated with Lund-Mackay (rs=0.441, p=0.015) and SNOT-22 (rs=0.495, p=0.003). Local IL-2R correlated with eosinophil counts and EPX activity, whereas other cytokines showed limited associations.

Conclusion:

Nasal swab EPX activity distinguishes eCRS and correlates with objective disease severity, whereas systemic cytokines do not reflect local inflammation. EPX activity and protein capture complementary aspects of eosinophilic inflammation.

1:55 pm – 2:01 pm

Pathways and metabolites in nasal mucus distinguish CRS subtypes

Marisa Griesel

Kathleen Bartemes, Research Associate

PROGRAM ABSTRACTS

Danielle Hunter, Research Technologist
Rohit Divekar, Consultant
Erin O'Brien, MD, FARS
Mayo Clinic

Introduction:

Subtyping chronic rhinosinusitis (CRS) as eosinophilic (eos) or non-eosinophilic (non-eos) disease is based on clinic history and endoscopy, but biomarkers of subtypes are limited. We used untargeted metabolomics to assess whether differences in nasal mucus metabolites can distinguish normal from CRS and predict CRS subtypes.

Methods:

Nasal mucus was collected from middle meatus of 15 normal and 31 CRS patients, subtyped clinically as 16 eos and 15 non-eos CRS patients. Eos and non-eos were analyzed individually and together as a CRS group. Metabolites were detected via liquid chromatography-mass spectroscopy. Non-differentiating metabolites identified by Kruskal-Wallis and Benjamini-Hochberg tests were removed, followed by transformation, scaling and analyses of endogenous metabolites.

Results:

13,680 metabolites were identified, of which 3457 were endogenous. 89 metabolites (in >1000 pathways) were upregulated in the CRS group including bile acid, reactive oxygen species, fatty acid and phospholipid synthesis, and cytokine signaling metabolites. The normal group had increased phospho- and sphingolipid metabolites (14 metabolites, 13 pathways). Of this list, 8 robust metabolites had 91% sensitivity and 83% specificity in detecting CRS. Eos (12 metabolites, >300 pathways) included phospholipid and adenosine pathway metabolites with non-eos (36 metabolites, >2000 pathways) represented by glycolysis and signal transduction metabolites.

Conclusion:

Metabolites from immune response, cell signaling, and lipid pathways differentiate normal and eos and non-eos CRS mucus. These biomarkers may indicate underlying etiologies of disease pathology and future targets.

2:02 pm – 2:08 pm

CRS inflammation reduction using LPB

Ahmed Abdelgawad, MD, PhD
Jessica Grayson, MD

Justin Turner, MD, FARS
University of Alabama at Birmingham

Rationale:

Chronic rhinosinusitis (CRS) is marked by persistent neutrophilic inflammation driven by IL-1 β , IL-6, IL-8, impaired epithelial barrier integrity, and elevated MMP-9. Microbial dysbiosis, including reduced Lactobacilli, has been linked to CRS pathophysiology. Because Lactobacillus plantarum RSB11 modulates airway inflammation, we hypothesized that live, heat-inactivated (HI), and metabolite-based RSB11 would reduce CRS-like inflammation in vitro and in vivo.

Methods:

Human Nasal Epithelial Cells (HNEpCs) were stimulated with LPS and treated with RSB11 Live, RSB11 HI, L(+) lactic acid, or PLGA-encapsulated metabolites. Cytokines (IL-6, IL-8, IL-1 β), MMP-9, and ZO-1 were quantified by ELISA and qPCR. A murine CRS-like model was generated by daily intranasal LPS for 21 days, followed by intranasal treatment with RSB11 Live, RSB11 HI, or PLGA metabolites from Days 21–28. Sinonasal tissues were analyzed for IL-6, IL-1 β , IL-10, MMP-9, ZO-1, and histology.

Results:

All RSB11 formulations significantly reduced LPS-induced IL-6, IL-8, IL-1 β , and MMP-9 in HNEpCs and partially restored ZO-1. In vivo, RSB11 Live, HI, and PLGA metabolites lowered IL-6 and IL-1 β and modestly increased IL-10.

Conclusion:

Live, heat-inactivated, and metabolite-based RSB11 attenuate CRS-associated inflammation and support barrier repair, indicating strong therapeutic potential as microbiome-restoring interventions for CRS.

2:09 pm – 2:15 pm

Q&A

2:15 pm – 2:45 pm

PANEL: “Recalcitrant CRS Without Polyps: Still Not Better...Now What?”

Moderator: Regan Bergmark, MD, FARS

Panelists: Fuad Baroody, MD, FARS; Chadi Makary, MD, FARS; Warren Mullings, MD; Alkis Psaltis, MBBS (hons), PhD, FRACS (ORL); Lindsay Ryan, MD

PROGRAM ABSTRACTS

2:45 pm – 3:15 pm

Break with Exhibitors in Regency

*Session Moderators: Victoria Lee, MD, FARS;
Dennis Tang, MD, FARS*

3:15 pm – 3:21 pm

Novel 3D printed “smell-aids” to improve olfactory function in post COVID-19 era

Joanne Xu
The Ohio State University

We previously invented non-invasive “Smell-Aids” to improve olfactory function by enhancing intranasal odorant delivery to the olfactory epithelium. However, the initial design was hand-made, lacking professional appearance, consistency, and scalability.

We attempted to prototype with 3D printing. 2 plug sizes were designed to accommodate different nostrils size, each incorporating diagonal airflow channels of either small (5mm) or large (7mm) diameters. These designs were then 3D printed using the Formlabs Form 3 SLA printer with Silicon 40A photopolymer resin.

We tested the prototypes in counter-balanced orders on 21 patients with confirmed olfactory losses (age 19-89y, median=59), majority of whom (12/21=57%) were non-COVID smell losses spanning 3m-19 years. The remaining were post-COVID long haulers (n=9; infected 11/26/20 to 3/11/24; persisted 10 to 61 months, median=52m). All patients achieved comfortable fit with at least one plug size. The 9-item NIH toolbox odor identification score significantly improved with the large channel (7mm) in the upward direction (baseline: 3.4 ± 1.94 vs plug: 4.2 ± 2.21 , $p < 0.05$). No significant improvement was observed with the plug downward direction nor with small diameter plugs. Through survey, 95% of patients agree or strongly agree that the Smell Aid is quite easy to use. However, 79% of patients suggest while it is a good idea but too awkward to use in public.

These results further demonstrated the promise of improving olfactory function through peripheral mechanisms with efficacy depending on the amount of air/odor flow (large channel) redirected to the olfactory region but still require further development to be cosmetic appealing to support continuous use.

3:22 pm – 3:28 pm

OCT for in vivo identification of olfactory neuroepithelium: Proof-of-concept study

Yi-Tsen Lin, MD, PhD
Kao-Tsung Lin, Doctor
Jaw-Lin Wang, Deputy Director
Ting-Wei Chang, Engineering
Shih-Chieh Lu, Manager
Ya-Ching Hsu, Doctor
National Taiwan University Hospital

Background:

Optical coherence tomography (OCT) is a noninvasive imaging modality that enables real-time, high-resolution visualization of tissue microarchitecture. While widely used in ophthalmology, its role in sinonasal epithelial characterization remains less well defined. We aimed to evaluate the feasibility of using OCT to identify olfactory neuroepithelium in vivo.

Methods:

Adult patients, aged 18 years and over, undergoing septoplasty or endoscopic sinus surgery were prospectively enrolled. Concurrent endoscopic and OCT imaging was performed at the olfactory regions (olfactory cleft) and control regions (inferior turbinate and lower nasal septum). Imaging data were extracted from recorded videos. Multiple frames per site were obtained under standardized acquisition parameters. OCT features were analyzed to identify characteristics associated with olfactory neuroepithelium, and diagnostic performance was assessed.

Results:

A total of 20 patients were included, yielding 280 paired OCT–endoscopic imaging sites (olfactory: n=150; control: n=130). A distinct translucent band was identified within the subepithelial layer in olfactory regions, which was not observed in control regions. The mean thickness of this band was $91.3 \mu\text{m}$. Stratified analysis showed that this feature was present in 74.0% of olfactory OCT images in patients with normosmia, compared with 24.7% in those with hyposmia.

Conclusion:

OCT demonstrates potential as a real-time, noninvasive modality for identifying olfactory neuroepithelium based on characteristic subepithelial features. Further studies correlating OCT findings with histopathologic validation and olfactory function testing are warranted to establish biological and functional relevance.

PROGRAM ABSTRACTS

3:29 pm – 3:35 pm

Local immune cell signatures underlying response to platelet-rich plasma for post-viral smell loss

Vivienne Li, BA
 Jennifer Lee, BS
 Arwa Kurabi, PhD
 ThomascZhou, BS
 Farhoud Faraji
 Sydney I. Ramirez, MD PhD
 Paul Lopez, BS
 Shane Crotty, PhD
 Carol H. Yan, MD
 University of California San Diego

Background:

Platelet-rich plasma (PRP) has emerged as a potential therapy for post-viral olfactory dysfunction (PVOD), though its mechanisms remain poorly defined. Prior cytokine profiling in this cohort suggested coordinated immune remodeling following PRP, but the responsible immune cell populations have yet to be characterized.

Methods:

Adults with refractory PVOD ≥ 6 months underwent bilateral olfactory cleft PRP injection. Paired olfactory cleft samples from this cohort, previously analyzed for cytokines, were evaluated using spectral flow cytometry, with immune subsets quantified among live CD45+ cells. Clinical outcomes were assessed using the University of Pennsylvania Smell Identification Test (UPSIT).

Results:

Nineteen subjects were enrolled (mean baseline UPSIT 19; OD duration 38 months), with 53% achieving MCID (UPSIT increase ≥ 4) at 42 days. Following PRP, paired analysis demonstrated decreased CD4+ regulatory T cells (CD25+/CD127-; $p=0.03$) and CD4+ resident memory T cells (TRM; CD69+/CD103+; $p=0.005$). Compared to controls, pre-treatment PVOD patients exhibited reduced non-classical monocytes ($p=0.04$) and classical dendritic cells ($p=0.03$). While overall CD11b+ cell count did not significantly change following PRP, responders demonstrated a greater increase in CD11b+ cells compared to non-responders ($p=0.03$). These cellular shifts paralleled paired cytokine changes in the same subjects, including increased CSF2 and decreased IL-6 and IL-33.

Conclusion:

In PVOD, PRP treatment was associated with modest clinical improvement. Integration of cellular and cytokine profiling suggests a shift toward a myeloid-enriched, reparative immune state, supporting the biological plausibility of PRP-mediated olfactory recovery.

3:36 pm – 3:42 pm

Rat model for nose-to-brain delivery to the CNS

Anisha DSouza, PhD
 Praveen Kulkarni, Principal Research Engineer
 Craig Ferris, Professor
 Mansoor M. Amiji, Professor
 Benjamin Bleier, MD, FARS

Introduction:

Effective CNS delivery of disease-modifying therapies in Parkinson's disease (PD) remains a major clinical challenge due to blood-brain barrier limitations. Brain-derived neurotrophic factor (BDNF) supports dopaminergic neuronal survival and motor function in animal models of PD, but systemic delivery is limited by poor CNS bioavailability. We evaluated the Minimally Invasive Nasal Depot (MIND) platform for sustained delivery of BDNF-upregulating oligonucleotide (antagoNAT).

Methods:

A hybrid PD model combining PINK1 KO rats with repeated mild traumatic brain injury (mTBI) was used to recapitulate reduced BDNF states observed in PD. Animals received an osmotic core-shell implant containing BDNF-antagoNAT using MIND to enable delivery to olfactory region. Outcomes included BDNF levels, neuroinflammation, vasogenic edema by MRI, dopaminergic markers, and motor function up to 40 days.

Results:

MIND delivery achieved sustained CNS exposure. In TBI+PINK1 KO female rats, MRI demonstrated a reduced apparent diffusion coefficient in substantia nigra, suggesting attenuation of vascular edema and white matter injury. BDNF upregulation was associated with preservation of dopaminergic neurons and improved motor performance. Male rats showed comparatively reduced therapeutic response.

PROGRAM ABSTRACTS

Conclusion:

The MIND platform offers a clinically viable trans-nasal strategy for targeted CNS delivery. BDNF antagoNAT demonstrated neuroprotection in our PD rat model with notable sex-specific differences. These findings support further investigation of intranasal depot systems for neurodegenerative disease management.

3:43 pm – 3:46 pm

Q&A

Session Moderators: Karen Bednarski, MD, FARS; Do-Yeon Cho, MD

3:47 pm – 3:53 pm

Swab derived eosinophil peroxidase activity identifies eosinophilic chronic rhinosinusitis

Evan Marsh, BS

Chelsea Pollard, Research Analyst

Kristine Smith Associate Professor

Fok Yun Chan, Research Scientist

Paul Neilson, Vice President R&D | BD

Benjamin Witt

Jeremiah Alt, MD, PhD, FARS

Gretchen Oakley, MD

Richard Orlandi, MD, FARS

Abigail Pulsipher, Research Assistant

University of Utah School of Medicine

Background:

Eosinophilic chronic rhinosinusitis (eCRS) requires tissue biopsy for diagnosis, limiting noninvasive stratification and monitoring. Because sampling region and type influence the representation of sinonasal inflammation, reliable minimally invasive biomarkers are needed. Eosinophil peroxidase (EPX) activity reflects eosinophil degranulation and may serve as a functional biomarker. We evaluated whether EPX activity across various sample types can identify eCRS.

Methods:

Subjects undergoing endoscopic sinus surgery were prospectively enrolled into an observational study. EPX activity was quantified in bulk mucus (n=21), plasma (n=34), and middle meatal swab samples (n=48). eCRS was defined as ≥ 10 eosinophils/high-power field in ethmoid tissue. Demographics and clinical variables were collected. Group comparisons were performed using Mann–Whitney tests. Enzymatic assay performance was assessed using ROC analysis.

Results:

A total of 70 subjects (23 non-eCRS; 47 eCRS) were enrolled. EPX activity demonstrated sample-type-dependent assay performance. Nasal swab EPX activity was significantly elevated in eCRS ($p=0.018$) and showed significant moderate discrimination in identifying eCRS from non-eCRS ($AUC=0.723$, $p=0.019$). In contrast, mucus ($AUC=0.482$; $p=0.916$) and plasma ($AUC=0.370$; $p=0.282$) EPX activity did not differ nor showed discrimination between groups.

Conclusions:

Middle meatal-derived EPX activity outperforms bulk mucus and plasma for identifying eCRS, highlighting the importance of sampling location in biomarker performance. This minimally invasive approach has the potential to enable outpatient disease stratification and longitudinal monitoring, reducing reliance on surgical tissue biopsy for diagnosis and prognosis.

3:54 pm – 4:00 pm

Nano-plastics exposure in a murine model induce nasal inflammation and p-STAT1 activation

Pallavi Madhusudanan, PhD

Hoang Bui-Nguyen, Medical Resident

Di Huang, Research Scientist Senior

Benjamin Bleier, MD, FARS

Mansoor M. Amiji, Professor

Alan Workman, MD, MTR

MEEI/HMS

Microplastics and nano-plastics (NPs) are emerging environmental contaminants increasingly detected in human respiratory tissues. Recent in vitro work demonstrates NP-induced epithelial inflammation in human cell culture. We developed a murine intranasal exposure model to characterize how nanoparticle composition, size, charge, concentration, and exposure route influence inflammation and signaling activation in the sinonasal cavity. Mice were dosed intranasally with 100nm polystyrene NPs with or without surface modification over 3 and 7-day exposure periods. Nasal tissue was analyzed for pro-inflammatory cytokine expression and p-STAT1 signaling, with saline-treated mice serving as controls. Additionally, confocal microscopy was employed to assess tissue distribution of fluorescently labeled NPs. NP exposure induced a significant dose-dependent pro-inflammatory response with

PROGRAM ABSTRACTS

elevated release of IL-1 α , IL-10, IL-6 and TNF- α compared to controls ($p < 0.0001$). Among the surface modifications tested, amine-modified NPs elicited the greatest inflammatory response. p-STAT1 was also elevated in NPs -exposed tissue and nasal tissue revealed distinct localization of labeled NPs, consistent with tissue penetration and retention. Intranasal exposure to nano-plastics results in tissue accumulation, with robust activation of pro-inflammatory and STAT1-dependent signaling pathways. This sustained inflammatory burden has the potential to precipitate inflammatory conditions or exacerbate pre-existing disease states. This model advances our understanding of NPs-induced pathology and serves as a valuable platform for identification of therapeutic targets and evaluation of localized treatment strategies aimed at mitigating these inflammatory effects.

4:01 pm – 4:07 pm

Host-microbe network analysis indicates loss of homeostasis as a hallmark of chronic rhinosinusitis

Vijay Ramakrishnan, MD, FARS

Background:

CRS is an inflammatory disease where microbiome alterations are increasingly recognized, but lacking in support for an active role in the disease. CRS endotyping characterizes immunological processes that may uniquely impact host-microbial interactions.

Objective:

To determine if characteristic endotype-defining cytokines are associated with specific microbiome alterations in CRS, and if microbial networks are associated with drivers of tissue inflammation in CRS.

Methods:

High-throughput sequencing of bacterial 16S rRNA, and tissue mRNA expression of cytokines and immune factors, were analyzed in biospecimens from CRS patients and controls ($n = 31$ total). Novel network analysis methods were applied in addition to standard quantitative multivariate analyses.

Results:

Sinonasal microbiota differed in CRS vs control, and within the CRSwNP phenotype. CRS tissues exhibited expected alterations in cytokines and human b-defensin 2. Network integration

indicates a generalized loss of community organization in CRS rather than implication of a distinct microbe, gene, or network responsible for the disease (robustness modularity 0.8 vs 0.6 in control vs CRS, respectively). Several possible microbial biomarkers of health were identified. Multivariate analysis revealed strong correlations between *Propionibacteria* and health, and the expression of IL25 and IL17 receptors.

Conclusions:

Rather than acquisition of pathogens and mucosal immune dysfunction as causative of CRS, we may view the disease as progressive degradation of a complex healthy host-microbial community ecology. This concept carries major implications for disease management, trajectory, and rehabilitation.

4:08 pm – 4:14 pm

Sinonasal microbiotyping and proteomic endotyping in CRS: An integrated multi-omic analysis

Steven Chen, MD, PhD

Daniel Frank

Vijay Ramakrishnan, MD, FARS

Introduction:

Chronic rhinosinusitis (CRS) affects up to 16% of the U.S. population and comprises heterogeneous subtypes with poorly understood etiologies. Sinonasal dysbiosis – depletion of commensals such as *Corynebacterium* with enrichment of pathogens including *Staphylococcus aureus* – is well-documented, yet its relationship to distinct inflammatory endotypes remains undefined. We present an integrated microbiome-proteome analysis in 111 CRS patients.

Methods:

Nasal lavage multiplex cytokine/chemokine profiles (31 analytes) were BCA-normalized, log2-transformed, and z-score scaled. Protein endotypes were derived by consensus clustering with optimal k by silhouette scores. For microbiotyping, 16S rRNA sequencing was performed and Jensen-Shannon distances were computed on genus-level OTU counts. Principal coordinates analysis with k -means defined microbiotypes labeled by dominant genus. Clinical metadata were tested for association with microbiotypes and protein endotypes.

Results:

Consensus clustering identified 4 protein

PROGRAM ABSTRACTS

endotypes among 111 patients. Microbiome analysis yielded 3 microbiotypes dominated by (1) *Corynebacterium*, (2) *Staphylococcus*, and (3) *Streptococcus/Haemophilus/Moraxella*, capturing 19.6% of compositional variance ($p=0.001$). Revision ESS was the only clinical variable independently associated with microbiome composition ($R^2=2.4\%$, $FDR\ p=0.015$). Protein endotype significantly associated with microbiotype (Fisher's $p=0.017$; PERMANOVA $R^2=4.0\%$, $p=0.018$).

Conclusion:

Integrated microbiome-proteomic profiling identifies reproducible sinonasal community states associated with distinct mucosal inflammatory endotypes, supporting a biologically meaningful microbiome-immune axis in CRS.

4:15 pm – 4:20 pm

Q&A

4:20 pm – 5:00 pm

PANEL: “Inside the Review Room: A Mock Grant Review for Industry-Sponsored NIH-Style Research Proposals”

Moderator: Murugappan Ramanathan, Jr., MD, FARS

Panelists: Benjamin Bleier, MD, FARS; Stella Lee, MD, FARS; Zachary Soler, MD, FARS

5:00 pm – 6:30 pm

RAPPers Event

Room: Cordoban, Mezzanine Level

5:00 pm – 6:30 pm

Poster Mentorship Session

“The Future of Rhinology, One Poster at a Time: Pearls from the Pros”

Room: Regency

Moderator: Christopher Roxbury, MD, FARS

The American Rhinologic Society is pleased to introduce the Poster Mentorship Session. This new event will bring trainee poster presenters together with experienced rhinologists in small-group discussions led by ARS member mentors. Trainees will present their research, receive personalized feedback, and connect with peers and faculty in a collaborative environment that promotes mentorship, professional development, and networking. The reception reflects the ARS commitment to education, scholarship, and the development of future leaders in rhinology. We look forward to welcoming trainees, mentors,

and members to this exciting event.

5:30 pm – 6:30 pm

Fellows Subgroup Forum Event

Rendezvous Court

7:00 pm – 8:30 pm

President's Reception

Room: Crystal, Lobby Level

Friday, October 16, 2026

Breakout Room C

Gold Room

1:00 pm – 5:00 pm

Room Moderator: Jivianne Lee, MD, FARS

1:00 pm – 1:30 pm

PANEL: “Biologics: Our Current Consensus on Usage”

Moderator: Jivianne Lee, MD, FARS

Panelists: Amber Luong, MD, PhD, FARS; Christopher Roxbury, MD; Neville Teo, MBBS, MRCS, MMed(ORL); Kevin Welch, MD, FARS; Adam Workman, MD

Session Moderators: Edward Kuan, MD, FARS; Corrina Levine, MD, FARS

1:30 pm – 1:36 pm

Genetic and molecular alterations on clinical outcomes in sinonasal squamous cell carcinoma

Srivatsa Surya Vasudevan, MD, MS

Amber Cradeur, MS4

Madeline Polson, MS4

Cherie-Ann O. Nathan, Professor

Omar Ahmed, MD, FARS

Michael T. Yim, MD, FARS

Background:

Sinonasal squamous cell carcinoma (SNSCC) is a rare malignancy with variable outcomes, and the prognostic impact of molecular alterations remains incompletely defined. This meta-analysis aims to clarify the associations of genetic alterations and protein expression with clinical outcomes in SNSCC.

Methods:

PubMed, Embase, Web of Science, and ScienceDirect were searched from inception through February 2026 for studies reporting prognostic outcomes in SNSCC according to

PROGRAM ABSTRACTS

genetic alterations or protein expression. Random-effects models were used to pool HRs, survival rates, and recurrence outcomes with 95% CIs.

Results:

Of 689 records, 25 studies with 1,194 SNSCC patients were analyzed. EGFR mutation was associated with worse overall survival (OS) at 2, 3, 5, and 10 years (HRs 1.57, 1.49, 1.41, and 1.32, respectively) and worse disease-free survival (DFS) at 1 and 3 years (HRs 3.70 and 1.51). TP53 mutation was associated with worse OS at 2, 3, and 5 years (HRs 3.54, 3.33, and 2.70). EGFR copy number gain was associated with worse 5-year OS (HR 1.59), EGFR overexpression with higher regional recurrence (HR 2.69), and PD-L1 expression with worse 3-year OS (HR 1.43). In contrast, Foxp3 expression was associated with improved 2-, 3-, and 5-year OS (HRs 0.42, 0.51, and 0.53) and DFS (HRs 0.48, 0.48, and 0.50). Other biomarkers, such as SOX2, Bax, p53 overexpression, and KMT2D expression, were not significantly associated with prognosis.

Conclusion:

Molecular profiling has prognostic value in SNSCC. EGFR and TP53 alterations were associated with poorer outcomes, whereas Foxp3 expression was associated with more favorable survival, supporting further biomarker-integrated risk stratification in SNSCC.

1:37 pm – 1:43 pm

Impact of high-volume steroid irrigation on inverted papilloma recurrence

Lirit Levi, MD

Maxime Fieux, MD, PhD

Yane Flavia De Barros Curado Fleury, MD

Mahdokht Sadat Manavi, MD

Alyssa Azevedo, MSN, FNP-C

Noel Ayoub, MD, MBA

Michael Chang, MD, FARS

Jayakar Nayak, MD

Peter Hwang, MD

Zara Patel, MD, FARS

Stanford

Introduction:

Inverted papilloma (IP) recurrence continues to be reported in the literature, despite evolution in surgical technique. Underlying inflammation may drive genetic mutation, viral susceptibility, and dysplastic change. We aimed to evaluate if

controlling inflammation with postoperative high volume steroid irrigation had any effect on rate of recurrence.

Methods:

We performed a retrospective review of patients who underwent resection of inverted papilloma at a tertiary sinus center with at least 5 years of follow-up. Demographic, clinical, histopathologic, and surgical data were collected, including smoking history, CRS status, tumor characteristics, and postoperative adherence to long term steroid irrigations. Univariate and multivariate regression analyses were used to assess recurrence risk factors.

Results:

92 patients were included. 42% had a smoking history and 35% had CRS. 70% had multifocal attachment. 49% were Krouse T3, and 22% were T4. 34% of patients had prior surgical resection attempts at outside hospitals. One patient had high-grade dysplasia. Overall, 35% of patients (n=33) used budesonide irrigations during follow-up. 54% of these patients were adherent for a full 5 years, and these patients had a 0% recurrence rate. On multivariate analysis, budesonide irrigation use was independently associated with reduced recurrence risk (OR 0.115, [0.006-0.682], p=0.049). Multifocal attachment was associated with increased recurrence risk (OR 12.7 [2.3-238.8], p=0.017).

Conclusions:

Postoperative high volume steroid irrigation was associated with improved 5-year disease free survival and lower recurrence risk, suggesting a possible protective role in the postoperative management of inverted papilloma.

1:44 pm – 1:50 pm

Appropriate follow-up period for asymptomatic post-treatment sinonasal squamous cell carcinoma

Phatchara Ruampattana, MD

Michael Xie, MD

Michelle Antony

Paul A. Gardner, Dr.

Georgios Zenonos, MD

Carl Snyderman, MD

Garret Choby, MD

Eric Wang, MD, FARS

University of Pittsburgh Medical Center

PROGRAM ABSTRACTS

Background:

Sinonasal squamous cell carcinoma (SNSCC) is a common malignancy of the nasal cavity and paranasal sinuses. Management in selected cases is surgical, with or without adjuvant or neoadjuvant therapy. Surveillance includes endoscopy and imaging; however, optimal duration, particularly in asymptomatic patients, remains unclear.

Objective:

To define when imaging surveillance can be discontinued in asymptomatic post-treatment SNSCC based on recurrence patterns and assess diagnostic performance of imaging and endoscopy.

Methods:

Single-institution retrospective cohort of adult (≥ 18 years) SNSCC patients treated surgically (endoscopic, open, or combined) from 2002–2025, with or without adjuvant therapy. Follow-up included endoscopy, scheduled imaging (CT, MRI, PET), recurrence, and survival.

Results:

66 patients (73 intervals) were included. 19 locoregional recurrences (LRR, 26.02%) occurred, highest frequency within 22 months. Kaplan–Meier analysis showed a plateau at P90 and P95 time-to-recurrence at 56 and 76 months. Of LRR, 73.68% were detected on routine surveillance; the rest were symptom-driven. 5 distant recurrences (DR) occurred (P90 47 months), all detected on routine imaging. MRI and PET showed 100% sensitivity, followed by endoscopy (92.31%) and CT (66.67%). Endoscopy had highest specificity (98.58%), followed by MRI (88.66%), CT (87.85%), and PET (86.30%).

Conclusions:

LRR occurs mainly within 2–5 years, and most recurrences are asymptomatic. Routine endoscopy should remain the primary surveillance modality given its high sensitivity and specificity. Locoregional imaging may be de-escalated after 56 months. However, as all DR were asymptomatic, continued distant surveillance imaging may still be warranted.

1:51 pm – 1:57 pm

Nivolumab confers survival benefit in recurrence sinonasal melanoma

Shweta Anand, MBBS, MS
Cameron Wilkinson
Skye Buckner
Amar Miglani, MD
Michael Marino, MD, FARS
Devyani Lal, MD, FARS
Mayo Clinic, Phoenix

Background:

Sinonasal mucosal melanoma (SNM) is characterized by high recurrence rates and poor survival. Novel immunotherapy is increasingly being used as part of multimodality treatment, but its survival impact is unclear.

Methods:

A retrospective cohort study was conducted to identify adults treated for SNM at a multi-hospital system between January 2000 and December 2025. Clinical, pathologic, treatment, and outcome variables were abstracted. Survival outcomes were analyzed with particular focus on post recurrence management strategies. Associations between recurrence timing, treatment modality, and mortality were evaluated.

Results:

Of 49 SNM patients identified, 28(57.14%) developed recurrent. Nivolumab treatment, used in 11 (39.3%) patients for recurrence was associated with improved mortality outcomes (3-year survival probability = 0.81, 95% CI [0.60, 1.00] vs 0.28, 95% CI [0.12, 0.66]; $p = 0.05$). Surgical intervention in the recurrent setting demonstrated a trend toward improved survival (3-year survival probability = 0.62, 95% CI [0.43, 0.91] vs 0.00) but not statistically significant ($p = 0.076$). Earlier time to recurrence from primary diagnosis (1 year or less) was associated with worse mortality (3-year survival probability = 0.17, 95% CI [0.04, 0.85] vs 0.71, 95% CI [0.51, 0.99]; $p = 0.013$).

Conclusions:

In our study of 49 recurrent SNM patients, immunotherapy with nivolumab, an immune checkpoint PD-1 inhibitor associated with improved survival benefit. In select recurrent cases, surgery may confer additional benefit. Earlier recurrence portends poorer prognosis. These findings support the role of novel immune checkpoint inhibitors as part of multimodal

PROGRAM ABSTRACTS

salvage strategies for these rare, aggressive cancer

1:58 pm – 2:04 pm

Sinonasal and skull base tumors: Next generation sequencing

Allison Rollins, MD

Garret Choby, MD, FARS

Carl Snyderman, MD

Diana Bell, MD

Eric Wang, MD, FARS

University of Pittsburgh Medical Center

Background:

Next generation sequencing (NGS) is increasingly available with potential diagnostic and therapeutic interventions for malignancies, but the role of NGS in sinonasal malignancies (SNM) is not defined despite challenges in diagnosis and identification of actionable targets.

Methods:

A retrospective review of all SNM treated at a single institution between 2004-2025 was conducted to identify roles of Oncomine NGS. Histologic and pathologic staining, NGS mutations and fusions; treatments delivered, comorbidities and survival were characterized with descriptive statistics.

Results:

Of 517 patients in our database, 61 had NGS performed (11.8%). Our cohort was largely male (57.9%), elderly (60±18), with few comorbidities, and had advanced stage disease (cT4, n=26, 41.9%). Twenty distinct pathologies and 30 unique clinically significant variants (CSVs or mutations) were identified. Of these 77% (n=48) had at least one CSV, the most common being IDH2 (n=7, 7.6%), PIK3CA (n=7, 7.6%), NOTCH (n=7, 7.6%), and TP53 (n=8, 8.7%). Notably 87.5% (n=7/8) of adenoid cystic carcinomas had MYB/NFIB fusion; SNUCs frequently demonstrated IDH2 mutation (85.7%, n=6/7); and all NRAS mutations were identified in mucosal melanoma. Half of patients received primary surgery with chemoradiotherapy, while the remaining received non-surgical therapy only. The primary utilization in this cohort was diagnostic with no patient receiving treatment recommendations based on a CSV identified.

Conclusion:

While NGS identified several unique CSVs, the utility of NGS in our institution appeared most

useful in diagnosis. Despite the potential of NGS for identifying targetable treatments in metastatic and/or unresectable disease, it may be limited in SNM at present.

2:05 pm – 2:10 pm

Q&A

Session Moderators: Leah Hauser, MD, FARS; Jose Mattos, MD, FARS

2:11 pm – 2:17 pm

Acoustic quantification of nasal patency

Jacob Johnson, MD

Vivek Mohan, MS

Peter Hwang, MD, FARS

Bryant Lin, MD, Meng

Paramesh Gopi, PhD

Anais Rameau, MD

Wendy Zhu, PA

Christoforo Meliadis

Background:

Measuring nasal resonance during speech is often difficult because sounds from the mouth mask nasal acoustics. This study evaluates if spectral changes in isolated speech segments correlate with symptom relief and serve as an objective biomarker for functional nasal patency following acoustic resonance therapy with a wearable device.

Methods:

16 subjects were evaluated in an observed clinical setting before and after acoustic resonance therapy. Nasal Congestion scores from the Total Nasal Symptom Score (TNSS) survey were extracted. Audio recordings were segregated into speech segments loaded with nasal consonants versus non-nasal controls. Spectral features were computed from the short-time power spectrum, and fundamental frequency (F0) was estimated using the probabilistic YIN algorithm. Paired t-tests evaluated acoustic and symptomatic shifts.

Results:

Patient-reported nasal Congestion improved significantly post-intervention (Mean Diff: -0.60; p=0.004). Laryngeal function (F0) remained stable (p=0.31). In nasal-loaded segments, significant resonant shifts occurred post-intervention: Spectral Centroid increased by 396 Hz (p<0.0001), Spectral Bandwidth broadened by 284 Hz (p<0.0001), and Spectral Rolloff elevated

PROGRAM ABSTRACTS

by 713 Hz ($p < 0.0001$). Identical analysis of matched non-nasal control segments yielded zero significant shifts across all spectral parameters ($p > 0.05$).

Conclusion:

Acoustic resonance therapy produced both subjective symptom improvement and objective spectral shifts in nasal-loaded speech segments, while non-nasal control segments and laryngeal function remained stable. These parallel findings suggest that spectral analysis of nasal speech segments may serve as an objective biomarker for nasal patency.

2:18 pm – 2:24 pm

Computer vision-based dynamic CT updates during ESS

Yashes Srinivasan
Graham Harris, BA
Nicole Gunderson, BS
Jeremy Ruthberg
Pengcheng Chen, MS
Aria Jafari, MD, FARS
Eric Seibel, PhD
Randall Bly, MD
Waleed Abuzeid, MD
University of Washington School of Medicine

Background:

Image-guided surgery (IGS) in endoscopic sinus surgery (ESS) may enhance surgical completeness but is limited by static preoperative CT imaging that progressively diverges from the reality of the surgical field during ESS. For the first time, we describe the use of a computer vision-based algorithm that generates virtual intraoperative CTs (viCT) with dynamic anatomic updates during live surgery.

Methods:

An endoscopic flythrough of the sinonasal cavity was performed at the start of the revision ESS with a standard monocular endoscope. Video was processed via a Neural Radiance Fields (NeRF)-based pipeline to generate 3D reconstructions of the surgical field. Reconstructions were co-registered to a baseline CT acquired before primary ESS, and resected tissue was algorithmically deleted from the CT volume, reflecting interval anatomic change from the primary ESS. ViCT accuracy was compared to ground truth CT obtained prior to the revision ESS.

Results: ViCT reflect prior surgical dissection on triplanar views relative to ground truth pre-revision CT. Quantitative comparison against pre-revision CT demonstrated high surface accuracy: 95th percentile Hausdorff distance of 1.27 mm, indicating low worst-case surface deviation and Chamfer distance of 0.14 mm reflecting minimal global surface discrepancy. Dice Similarity Coefficient of 0.87 and Jaccard Similarity Index of 0.77 indicated precise volumetric spatial overlap.

Conclusion:

viCT generated from standard endoscopic video accurately reflects anatomic changes resulting from ESS. Critically, demonstrating feasibility in live surgery conditions marks an important advance in viCT as a dynamic imaging adjunct that simulates intraoperative CT without radiation.

2:25 pm – 2:31 pm

Mucosal sensitivity to air-jet among patients with turbinate hypertrophy and/or septoplasty

Nidhi Jha, MD, PhD Student
Kanghyun Kim, BS
Joanne Xu
Lauren Gastineau
Ahmad Odeh
Jack Harness
Bradley Otto, MD
Kathleen Kelly, MD
Kai Zhao, Dr.
The Ohio State University

Objectives:

Subjective complaint of nasal obstruction is a complex interplay of nasal anatomy, airflow dynamics, and sensory feedback. This study examines mucosal sensitivity among 14 patients with turbinate hypertrophy and/or septal deviation (septo-turb) pre- and >2 months post-surgery to determine its contribution to outcome.

Methods:

15 ms air jets with flow rates ranging 0.5 to 5 L/min were delivered via 25-gauge microcannula, with a 0.01 x 0.03-inch side opening placed 2 mm from the mucosal surface at predetermined sites. Detection thresholds were determined using a single-staircase method in 0.5 L/min steps.

Results:

Patients significantly improved symptom scores post-surgery: NOSE (pre: 55 ± 22.44 , post: 15.36 ± 10.97) and VAS (pre: 4.37 ± 2.43 , post: 0.91 ± 1.01). They also had significantly lower

PROGRAM ABSTRACTS

thresholds (more mucosal sensitive) post-surgical at all stimulation sites, e.g. nasal valve [medial (pre: 3.14 ± 1.63 post: 2.25 ± 1.03 , $p < 0.05$), lateral (pre: 3.34 ± 1.60 post: 2.57 ± 1.32 , $p < 0.05$)], head of inferior turbinate [septum (pre: 3.82 ± 1.23 post: 2.98 ± 1.29 , $p < 0.05$), opposite septum (pre: 3.66 ± 1.37 post: 2.52 ± 1.07 , $p < 0.05$)], and middle of inferior turbinate [septum (pre: 3.98 ± 1.33 post: 2.93 ± 1.28 , $p < 0.05$), opposite septum (pre: 3.93 ± 1.34 post: 2.41 ± 0.87 , $p < 0.05$)]. Significant correlations were found between symptom scores and thresholds at the inferior turbinate head (NOSE: $\rho = 0.358$ $p = 0.007$, VAS: $\rho = 0.312$ $p = 0.019$) and middle of the inferior turbinate (NOSE: $\rho = 0.475$ $p < .001$, VAS: $\rho = 0.472$ $p < .001$).

Conclusion:

This study confirmed that significant improved mucosal sensitivity may contribute to post-surgery nasal obstruction outcome and may lead to novel therapeutic approaches focusing on restoring healthy mucosa sensitivity.

2:32 pm – 2:38 pm

5-year psychological dysfunction outcomes after endoscopic sinus surgery for chronic rhinosinusitis

Allen Zhou, MD

Jack Ghannam

Stacey Gray, MD, FARS

Ralph Metson, MD, FARS

Mass Eye and Ear/Harvard Medical School

Background:

Psychological dysfunction is prevalent in chronic rhinosinusitis (CRS) and significantly impairs quality of life. While short-term improvements in psychological dysfunction after endoscopic sinus surgery (ESS) have been established to 15 months, longitudinal data are lacking, and predictors of non-response have not been identified.

Methods:

1307 patients with CRS prospectively completed the 22-item sinonasal outcome test (SNOT-22) preoperatively and at 3 months, 1 year, and annually thereafter. SNOT-22 psychological domain was defined using a 5-question structure (reduced productivity, reduced concentration, frustrated/restless/irritable, sad, and embarrassed) (range 0-25). A minimally clinically important difference (MCID) of 3.9 points was applied. Non-responders were defined as patients

with preoperative score > 3.9 who failed to achieve MCID at 1 year. Multivariable logistic regression identified independent predictors of non-response.

Results:

Mean psychological domain scores improved from 8.4 ± 6.1 preoperatively to 3.7 ± 4.8 at 1 year and 4.0 ± 5.1 at 5 years ($p < 0.001$). Among patients with preoperative psychological burden (score > 3.9 ; $n = 603$), 70% achieved MCID at 1 year ("responders"); MCID was maintained through 5 years. Thirty percent ($n = 181$; "non-responders") failed to achieve MCID. On multivariable analysis, CRS with polyps (OR 0.55; 95%CI 0.36–0.82; $p = 0.004$) and higher preoperative psychological domain score (OR 0.88/point; $p < 0.001$) independently predicted better response.

Conclusions:

ESS produces durable improvements in psychological dysfunction through 5 years. 30% of patients fail to achieve MCID with absence of polyps and lower preoperative psychological domain score as predictors of non-response.

2:40 pm – 2:45 pm

Q&A

2:45 pm – 3:15 pm

Break with Exhibitors in Regency

3:15 pm – 3:55 pm

PANEL: "Practice Selection: Which Setting is Best for You?"

Moderator: Erin Lopez, MD, FARS

Panelists: Greg Davis, MD, FARS; Doug Farqhar, MD; Jessica Grayson, MD; Katie Melder, MD

PROGRAM ABSTRACTS

Session Moderators: Meha Fox, MD, FARS; Chadi Makary, MD, FARS

3:56 pm – 4:02 pm

National trends in rhinology fellowship training

Samuel E. Razmi, MD, Meng
Ahmed Abdou, Medical Student
Shalini Namaduri, Medical Student
Hassan Baig, Medical Student
Faizaan Khan, Medical Student
Zain Moin, Medical Student
Sebastian Guadarrama-Sistos Vazquez, Research Coordinator
Dana Crosby, MD, FARS
Masayoshi Takashima, MD, FARS
Omar Ahmed, MD, FARS

This first-of-its-kind national analysis of rhinology fellowship case logs defines how operative exposure is changing in training for sinonasal and anterior skull base surgery.

We retrospectively reviewed case volumes from 15 US rhinology fellowships from July 2019-July 2024. To reduce COVID-related distortion, March-June 2020 were excluded and comparisons standardized to the first 8 months of academic years 2021-2024. Cases were grouped into primary and revision ESS, pituitary/sellar surgery, sinonasal tumors/expansile lesions, Draf III, orbital decompression, CSF leak repair, nasal airway surgery, and office rhinitis procedures. Trends were analyzed using chi-square testing and exploratory log-linear Poisson modeling; significance was set at $p < 0.05$.

Primary ESS, pituitary/sellar surgery, and sinonasal tumors/expansile lesions comprised the largest share of fellowship volume. Revision ESS decreased significantly by 70.7% ($p = 0.0022$). Nasal airway surgery increased by 158.8% ($p = 0.018$) and office rhinitis procedures by 1080% ($p = 0.043$). Primary ESS increased by 17.3% ($p = 0.51$). Draf III decreased by 43% ($p = 0.20$), orbital decompression by 49.2% ($p = 0.44$), and CSF leak repair increased by 25.2% ($p = 0.73$). Temporal case-mix trends differed by region ($p < 0.001$).

Rhinology fellowship remains broad, but operative exposure is shifting. Fellowship case mix varied significantly by region. Revision ESS declined and orbital decompression trended downward, likely reflecting the introduction of biologic therapies. Office procedures rose with newer technologies,

and fellowship experience shifted toward greater skull base surgery. Modern fellowship training is being reshaped by medical therapy, office intervention, and skull base complexity.

4:03 pm – 4:09 pm

Rhinology fellowship training in the United States: Insights from a national survey

Daniel Spielman, MD
Nicholas Rowan, MD
Hemali Shah, MD
Tran Locke, MD, FARS
Tyler Merrill, MD
Jacob Rosenstadt
Carol H. Yan, MD
Joshua M. Levy, MD
MedStar Georgetown University Hospital

Background:

The proportion of otolaryngology trainees pursuing fellowship has increased alongside an expansion in rhinology fellowship programs. This study assesses contemporary data evaluating trainee motivations, expectations, and outcomes among U.S. rhinology fellows over a 7-year period.

Methods:

A combined prospective and retrospective survey was conducted using anonymous questionnaires administered to incoming and outgoing fellows at U.S. rhinology fellowship programs from 2018 to 2025. Surveys evaluated motivations, procedural comfort, research expectations, career plans, and overall satisfaction. Responses were analyzed descriptively.

Results:

A total of 241 responses were analyzed. The primary motivation for fellowship was to enhance surgical skills and clinical decision-making, with fewer respondents citing research or mentorship. Fellows reported high comfort with standard endoscopic sinus procedures but lower confidence with open approaches and expanded skull base techniques. Protected research time was variable, with 16–45% of graduating fellows reporting none. While 75.8% of incoming fellows anticipated academic careers prior to fellowship, 58.6% ultimately entered academic practice.

Overall satisfaction was high, with 86.3% reporting that fellowship met expectations. Reported shortcomings included limited skull base exposure, reduced surgical autonomy, inadequate academic time, and a lack of billing/coding training.

PROGRAM ABSTRACTS

Conclusion:

Rhinology fellowship trainees primarily pursue subspecialty training to enhance surgical skills and clinical decision-making. Although training is overwhelmingly perceived as meeting expectations, meaningful gaps exist between anticipated and actual experiences.

4:10 pm – 4:16 pm

Gender differences in coding and procedural ratios among academic rhinologists

Abigail Homan

Graham Pingree, MD

Andrew J. Tompkins, MD, MBA

Vinay Rathi, MD

Katie M. Phillips, MD, FARS

Background:

There are substantial differences in compensation between female and male otolaryngologists. This discrepancy may be due to variation in physician billing practices. We sought to investigate this hypothesis in the field of rhinology.

Objective:

To evaluate whether gender differences exist in E/M coding patterns and procedure utilization among academic rhinologists using Medicare data.

Methods:

We conducted a retrospective observational study of Medicare claims data (2017–2023). Academic rhinologists affiliated with otolaryngology residency programs were identified, collecting gender, fellowship year, and NPI. We analyzed ratios of (1) evaluation/management visit levels and (2) debridement to endoscopic sinus surgery (proxied by maxillary antrostomy) utilization.

Results:

Rhinologists identified annually ranged from 157 to 224 (female rhinologists ranged from 32-51, male rhinologists ranged from 124-189). Male rhinologists demonstrated a higher proportion of high-complexity evaluation and management coding compared to female rhinologists in select years, including 2017 (CPT 99205; $p=0.002$) and 2019 (CPT 99205; $p=0.01$), as well as 2021 (CPT 99214; $p=0.007$) and 2022 (CPT 99214; $p=0.03$). Across 6 of 7 years analyzed, male rhinologists exhibited a significantly higher ratio of postoperative debridement procedures (CPT 31237) relative to endoscopic sinus surgery.

Conclusion:

Gender-based differences in coding patterns and procedural utilization may exist among academic rhinologists. These differences in billing practices may contribute to compensation differences. Further investigation is warranted to understand the drivers of these differences and to ensure equitable evaluation metrics.

4:17 pm – 4:23 pm

Aging and frailty are drivers of purulence and microbial culture results in chronic rhinosinusitis

Jisue Kang, BA

Nicolaus Knight, Clinical Data Specialist

Sandeep Goswami, Scientist

Krishna Josyula, Medical Student

Jessica Grayson, MD

Do-Yeon Cho, MD

Bradford Woodworth, MD, FARS

Justin Turner, MD, FARS

University of Alabama at Birmingham

Introduction:

Patients with chronic rhinosinusitis (CRS) often develop treatment-resistant disease with advancing age. Recent studies suggest an age-related shift towards a neutrophilic endotype and changes in bacterial prevalence. However, confounders—particularly frailty—have made it difficult to determine if age itself is an independent predictor of these changes. This study evaluates the relationship between age and bacterial cultures, accounting for frailty, to determine whether age independently influences microbial patterns in CRS.

Methods:

We analyzed endoscopic sinus surgery patients at a tertiary care academic center between 2015 and 2025 ($n=1,409$). Patients were stratified into two groups (ages 18–60 and >60) and frailty was assessed using the modified 5-factor frailty index (mFI-5). Multivariate analyses evaluated the effects of age and frailty on culture results.

Results:

Among patients with CRS without nasal polyps (CRSsNP), older patients had higher rates of *Pseudomonas aeruginosa* ($p=0.007$) and *Serratia* ($p=0.01$) and lower rates of *Haemophilus influenzae* ($p=0.009$). In patients with CRS with nasal polyps (CRSwNP), older age was associated with increased *P. aeruginosa* prevalence ($p=0.04$). Each 1-point mFI-5 score

PROGRAM ABSTRACTS

increase was associated with a 23% increase in overall culture positivity, independent of age. Conversely, after adjusting for frailty, each additional year of age was associated with a 1.8% increase in *P. aeruginosa* positivity in CRSsNP patients and a 2.6% increase in CRSwNP patients.

Conclusion:

Frailty is independently associated with higher overall culture positivity. However, age—when controlling for frailty—is independently associated with species-specific changes, particularly in *P. aeruginosa*.

4:24 pm – 4:30 pm

Q&A

Session Moderators: Naweed Chowdhury, MD; Patricia Loftus, MD, FARS

4:31 pm – 4:37 pm

WITHDRAWN

4:38 pm – 4:44 pm

Early life determinants of the pediatric nasal microbiome in rural Bangladesh

Maximilian J. Bailey, MSc
Talat Islam, Assistant Professor
Tanya L. Alderete, Associate Professor
Noel Ayoub, MD, MBA

Background:

The nasal microbiome has been implicated in inflammatory states and colonization resistance against respiratory pathogens. Early-life determinants of the nasal microbiome have yet to be fully characterized. This study characterized clinical and environmental impacts on the composition and architecture of the nasal microbiome in rural Bangladeshi infants.

Methods:

70 infants (~1-year of age) were prospectively enrolled from rural Bangladesh. The nasal microbiota was characterized using 16S rRNA sequencing. PM2.5 exposure was quantified using optical sensors. Analyses included diversity analysis, differential abundance testing, envfit variance partitioning, and Bayesian co-occurrence network analysis, with models adjusting for age, delivery mode, sex, and birthweight.

Results:

Early antibiotic and PM2.5 exposure explained 4.9% and 5.2% of microbial variance,

respectively. PM2.5 was negatively associated with alpha diversity (Beta= -0.20, P<0.05). Antibiotic exposure was significantly associated with 25 bacterial genera, with several displaying time-dependent associations (FDR<0.05). Notably, antibiotic exposure enriched *Staphylococcus* (log fold change = 1.03, FDR<0.05). PM2.5 exposure was associated with 19 genera. Network analysis revealed that antibiotic and PM2.5 exposure were linked to elevated clustering and betweenness centrality and reduced global efficiency (P<0.05).

Conclusion:

Early life antibiotic and air pollution exposure exhibited system wide associations with the nasal microbiome, including altered composition and shifts toward more modular, fragmented microbial communities. These changes may have implications for mucosal resilience, inflammation, and susceptibility to respiratory infection.

4:45 pm – 4:51 pm

Nickel exposure and CRS severity: A Lund-Mckay analysis

Victor M. Arechiga, BA
Mishek Thapa, Medical Student
Hong-Ho Yang, MD
Melodyanne Cheng, Medical Student
Rory Lubner, MD
Jeffrey Suh, MD, FARS
Marilene Wang, MD, FARS
Daniel Beswick, MD, FARS
Jivianne Lee, MD
UCLA School of Medicine

Introduction:

Ambient heavy metal exposure has been linked to upper airway inflammation, yet its specific contribution to chronic rhinosinusitis (CRS) severity remains unclear. Nickel is a respiratory toxicant released into ambient air primarily through fossil fuel combustion and industrial emissions, with established pro-inflammatory properties. We evaluated the association between residential nickel exposure and radiographic CRS burden through Lund-McKay (LM) scoring.

Methods:

This is a retrospective study of 1,172 CRS patients undergoing sinus CT imaging at a tertiary rhinology center (2018-2022). ZIP codes were linked to 20-year modeled nickel concentrations from California Air Toxics Assessments. LM score was modeled as log(LM+1) and analyzed using bootstrap Ordinary Least Squares (OLS) across

PROGRAM ABSTRACTS

three sequential model specifications adjusting for age, sex, year, smoking history, hypertension, diabetes and asthma.

Results:

Higher residential nickel exposure was independently associated with elevated LM score (OR 1.54, 95% CI: 1.13-2.10, $p < 0.01$). Bootstrap OLS analysis confirmed a significant positive association across all three model specifications, with the effect remaining consistent through covariate adjustment including comorbidities and demographic factors. Despite a 30% decline in mean LA nickel concentrations from 1989-2021, exposure remained significantly associated with CRS severity, suggesting the sinonasal tract is sensitive to even lower-level chronic exposure.

Conclusion:

Residential Nickel exposure was independently associated with greater radiographic CRS burden, suggesting ambient heavy metal exposure may represent an underrecognized and potentially modifiable environmental risk factor for CRS severity.

4:52 pm – 4:58 pm

Military exposures and CRS

Conner Massey, MD

Lauren Zell-Baran

Cecile Rose

Vijay Ramakrishnan, MD, FARS

Silpa Krefft

Introduction:

Since 2001, over 3 million individuals have deployed to Southwest Asia (SWA) as part of several United States military operations. Personnel were exposed to airborne toxics, such as burn pits, desert dust/sand and combat dust. The relationship between these exposures and chronic rhinosinusitis (CRS) is poorly characterized. We hypothesized that deployment exposures would be associated with sinus radiological disease severity.

Methods:

Veterans deployed to SWA who developed respiratory symptoms were prospectively enrolled into an observational cohort, collecting demographics, military exposure history, and past medical history. Military exposures (burn pits, combat dust, desert sand, diesel exhaust) were semi-quantified into a log-transformed exposure index (log-EI) incorporating frequency and

duration of exposures. For those with sinus CTs, Lund-Mackay scoring (LMS) was performed. LMS ≥ 4 was used as a proxy for CRS diagnosis. Statistical analysis was performed in Python.

Results:

122 subjects had sinus CTs. The cohort was 89% male. 41 subjects had a LMS ≥ 4 ; among these, radiological disease severity was moderately correlated with log-EI (Pearson $r = 0.36$, $p = 0.03$). Subjects with LMS ≥ 4 were more likely to have a history of serum eosinophilia (OR=8.17, $p < 0.001$). Multivariable linear regression showed statistical significance between Log-EI and LMS when controlling for lower airway disease and smoking status (R-squared=0.31, F-test $p = 0.01$).

Conclusion:

This is the first study showing that military exposures are associated with increased sinus radiological disease severity. Those with worse radiologic disease may have underlying eosinophilia. Further characterization may yield more precise treatment strategies.

4:58 pm – 5:00 pm

Q&A

5:00 pm – 6:30 pm

RAPPers Event

Room: Athenian

5:00 pm – 6:30 pm

Poster Mentorship Session

“The Future of Rhinology, One Poster at a Time: Pearls from the Pros”

Room: Regency

Moderator: Christopher Roxbury, MD, FARS

The American Rhinologic Society is pleased to introduce the Poster Mentorship Session. This new event will bring trainee poster presenters together with experienced rhinologists in small-group discussions led by ARS member mentors. Trainees will present their research, receive personalized feedback, and connect with peers and faculty in a collaborative environment that promotes mentorship, professional development, and networking. The reception reflects the ARS commitment to education, scholarship, and the development of future leaders in rhinology. We look forward to welcoming trainees, mentors, and members to this exciting event.

PROGRAM ABSTRACTS

5:30 pm – 6:30 pm

Fellows Subgroup Forum Event

Rendezvous Court

7:00 pm – 8:30 pm

President's Reception

Room: Crystal, Lobby Level

Saturday, October 17, 2026

General Session – Biltmore Bowl

8:00 am – 12:00 pm

Room Moderator: Marc Dubin, MD, FARS

*Session Moderators: Kara Detwiler, MD, FARS;
Nyall London, MD, FARS*

8:00 am – 8:06 am

The completion of surgery index (CoSI): A multi-institutional study of surgical adequacy

Alan Workman, MD, MTR

Margaret Mitchell, MD, MS-HPed

James Palmer, MD, FARS

Background:

The Completion of Surgery Index (CoSI) is a CT-based scoring system designed to identify patients with CRSwNP who have had previously incomplete surgery. Single-institution studies have shown that a CoSI <70, reflecting incomplete prior surgery, is associated with greater improvement in SNOT-22 and asthma control following high-quality revision surgery. We sought to validate CoSI in a large multi-institutional cohort.

Methods:

We performed a retrospective analysis of CRSwNP patients who underwent revision ESS at 8 tertiary care centers from 2022 to 2024. Preoperative CoSI scores, timing of treatment, and pre- and postoperative SNOT-22 scores were collected.

Results:

160 subjects undergoing revision ESS for CRSwNP were included across 8 centers. Patients with incomplete prior surgery (CoSI <70) experienced significantly greater postoperative improvement in SNOT-22 scores (6-24 months) than patients with CoSI ≥70 (35.2 ± 17.8 vs 18.7 ± 18.6 points; $p < 0.0001$). This CoSI association remained significant after adjustment for demographics, AERD, asthma, number of prior surgeries, biologic use, and baseline SNOT-22.

Spline modeling demonstrated a nonlinear relationship between preoperative CoSI and postoperative symptom improvement ($p < 0.01$), with an inflection point at a CoSI of 70, supporting clinical relevance of this threshold.

Conclusions:

Preoperative CoSI is a robust independent predictor of symptomatic improvement after revision ESS in CRSwNP. A CoSI score of <70 identifies patients with incomplete prior surgery who are most likely to benefit from high-quality revision surgery. In the biologic era, inadequate prior surgical intervention remains an important and correctable contributor to symptom burden.

8:07 am – 8:13 am

Integration of structured histopathology with the completeness of surgery index in CRSwNP patients

Vidit Talati, MD, MS

Kerol Faltas

Michael Xiang

Randy Bach, BS

Spencer Yueh

Margaret Mitchell, MD, MS-HPed

Michael Kohanski, MD, PhD

Jennifer Douglas, MD

Nithin Adappa, MD, FARS

John Bosso, MD

James Palmer, MD, FARS

University of Pennsylvania

Background:

The Completeness of Surgery Index (CoSI) is a novel metric for assessing surgical quality in CRSwNP. Structured histopathology (SHP) is helpful for characterizing drivers of inflammation. The integration of these two tools to identify patients at higher risk for surgically recalcitrant disease has not been explored.

Methods:

CRSwNP patients with a pre-operative CoSI < 70 undergoing primary or revision ESS followed by steroid irrigations from 2018-2025 were included. CT images and data about comorbidities, SHP, biologic use, and SNOT-22 scores were retrospectively reviewed. Logistic regression, t-tests, and Chi-squared tests were used for analysis.

Results:

The cohort comprised 210 patients achieving significant SNOT-22 improvement 12 months

PROGRAM ABSTRACTS

post-ESS (-29.1 ± 22.1 ; $p < 0.001$). Mean age was 48.4 years, 53 (25.2%) had AERD, and 114 (54.3%) were revision cases. Rates of pre- and post-operative biologic use were 13.8% and 11.0%, respectively. Mean preoperative CoSI was 37.2 among revisions. All patients had CoSI ≥ 70 post-ESS with a mean of 85.9. Among SHP variables, only neutrophil infiltrate correlated with less improvement in SNOT-22 at 12 months (-22.4 vs. -33.8 ; $p = 0.007$) on multivariate analysis. No SHP variables were associated with an increased rate of postoperative biologic use for CRSwNP or asthma.

Conclusion:

Complete surgery affords significant sustained SNOT-22 improvement even with high tissue eosinophilia or abnormal tissue architecture. Neutrophil infiltrate and a mixed inflammatory picture may dampen improvement in patients achieving CoSI ≥ 70 . Combining SHP with CoSI may be helpful for optimizing surgical outcomes and decision-making regarding adjunct medical therapy postoperatively.

8:14 am – 8:20 am

Application and validation of the novel completion of surgery index (COSI)

Shweta Anand, MBBS, MS

Narin Carmel, MD

Gaurav Jategaonkar, MD

Michael Marino, MD, FARS

Amar Miglani, MD

Devyani Lal, MD, FARS

Mayo Clinic, Phoenix

Background:

Incomplete sinus surgery may contribute to persistent CRS and need for revision ESS. The novel "Completeness of Sinus Surgery Index," (CoSI) objectively assesses extent of prior ESS. We used CoSI to assess a cohort undergoing revision ESS.

Methods:

A retrospective study of adult CRS patients who underwent revision ESS at a tertiary-care center (2020-2023) was studied. CT scans were assigned CoSI scores as per Workman (2025). Baseline and post-op SNOT 22 scores at 3, 6, and 12 months were studied.

Results:

Eighty CRS patients, 34 CRSwNP, were

included. Baseline median total SNOT-22 was 42.5 (IQR 28-57). Median CoSI was 50 (IQR 35-63.7). SNOT-22 significantly improved post-ESS at 3 (median 24; IQR 13-37), 6 (median 21.5; IQR 10.2-32), 12 months (median 20.5; IQR 8-38) ($p < 0.05$), exceeding MCID at all time points. Patients with CoSI < 70 had greater SNOT-22 improvement ($p < 0.5$) vs. CoSI ≥ 70 ($n=20$) from baseline median of 43.5 (IQR 32-63.3) to drop at 3 (median 21.5; IQR 12-42.6), 6 (median 18; IQR 9-34) and 12 months (median 26; IQR 9-34.5)]. In CRSsNP, those with CoSI < 70 showed significantly greater SNOT-22 improvements at all times points ($p < 0.05$) vs. those with CoSI ≥ 70 . In CRSwNP, similar improvement was noted for high or low CoSI.

Conclusion:

Revision ESS for CRS resulted in significant, sustained improvement in SNOT-22, with much greater improvement for CoSI < 70 . In CRSsNP, those with CoSI < 70 had greater improvement than those with more complete prior ESS. In CRSwNP, post-ESS improvement occurred regardless of CoSI score, addressing polyps, debris even in more complete prior surgery. Our study also provides cross-institutional validation of CoSI for assessment and prognostication in revision ESS for CRS.

8:21 am – 8:27 am

Assessing surgical extent before biologic therapy for CRSwNP

Alison Yu, MD

Kristina LaPointe, Research Associate

Kaitlyn Ann Roberts, Research Fellow

Michelle Yu, MD

James Palmer, MD

Alan Workman, MD

Jose Mattos, MD, FARS

Rodney J. Schlosser, MD, FARS

Zachary Soler, MD, FARS

Background:

The Completion of Surgery Index (CoSI) was recently developed to define the adequacy of previous sinus surgery based on radiographic evidence of residual bony partitions where lower scores (out of 100) indicate more incomplete prior surgery. The purpose of this study was to determine the extent of prior sinus surgery in patients electing biologic therapy.

PROGRAM ABSTRACTS

Methods:

This was a prospective, multicenter cohort study that included adults (18+ years old) with CRSwNP. All patients had failed traditional medical therapies and required to have bilateral nasal polyps with grade >1 on each side and olfaction score >1. Patients were recruited into the study after they elected to receive dupilumab as part of shared decision-making with their treating otolaryngologists. CoSI scores were calculated from the baseline CT scans.

Results:

The study included 58 CRSwNP patients treated with dupilumab. The mean CoSI score of the entire cohort was 60.1±19.3, ranging from 0 to 90. Sixteen (27.6%) patients did not have sinus surgery, whereas 42 (72.4%) patients did. Of those who had prior surgery, 21 (50.0%) had CoSI scores 1-69 (incomplete surgery) and 21 (50.0%) had CoSI scores 70+ (complete surgery). Seventeen (40.5%) had one prior surgery, and 25 (59.5%) had 2+ prior surgeries. By individual CoSI subcategory, the frontal sinus (31.0%) and middle turbinate/draf 3 (52.4%) were the least likely to have had any intervention (CoSI=0) ($p<0.001$).

Conclusions:

Approximately two-thirds either had no surgery or incomplete surgery before biologic therapy. The frontal sinus was the least frequently addressed with surgery. Further studies are needed to clarify the motivations underlying the shared decision-making for biologic therapy.

8:28 am – 8:34 am

Extent of sinus surgery is associated with disease control in biologic treated type-2 dominant CRS

Nicholas Campion, MBChB, PhD

Peta-Lee Sacks, Dr.

Lu Hui Png, Dr.

Ruoxin Hua

Rhea Darbari Kual, Dr.

Raquel Alvarado, Dr.

Christine Choy

Raymond Sacks

Raewyn Campbell, MD, FARS

Larry Kalish, MBBS

Richard Harvey, MD, PhD

Background:

A greater benefit of biologics is observed after

surgery in type-2 chronic rhinosinusitis with nasal polyps (CRSwNP). However, the extent of surgery remains undefined in many studies. This study evaluated the extent of surgery on disease control in patients receiving biologics for refractory type 2 dominant CRSwNP.

Methods:

A cross-sectional study was performed on patients with CRSwNP treated with biologics for ≥6 months at a tertiary center. All patients had undergone prior sinus surgery which included a complete sphenoidectomy and then extension via Draf I, IIa, IIb, IIc, or III. Disease control was defined as having a SNOT-22 ≤30, endoscopic modified Lund-Mackay ≤4, and absence of rescue therapy within 6 months. Comparisons were made across surgical and biologic groups, and logistic regression was used to identify factors associated with disease control.

Results:

159 patients were assessed (age 50.9±12.8yrs, 45.3% female). Disease control was achieved in 49.1%. Disease control was greater with extended surgery (Draf III 63.3% vs Draf IIc 68.3% vs Draf IIa 8.7% vs Draf I 0%, $p<0.001$). Control was similar across biologic type (anti-IL-4αR 63.3% vs anti-IL-5/5R 45.7%, $p=0.105$). On regression, extended surgery (Draf III + IIc) was associated with disease control (Draf III/IIc vs Draf IIa/I: OR 110.2 [12.7-14682.5]) but not biologic type (anti-IL-4αR vs anti-IL-5/5R OR 2.15 [0.7-7.2]). However, class switching had already occurred in 15.1% of patients initially treated with anti-IL-5/5R.

Conclusions:

Disease control was greatest in CRSwNP patients who had both extended sinus surgery and had their biologic treatment optimized.

8:35 am – 8:40 am

Q&A

8:40 am – 9:00 am

ARS Business Meeting & President

Citations / MOU Signing with Canada

Amber Luong, MD, PhD, FARS; Brent Senior, MD, FARS

9:00 am – 9:30 am

Break with Exhibitors in Regency

PROGRAM ABSTRACTS

9:30 am – 10:30 am

22nd Annual David W. Kennedy Lectureship

Guest Speaker: Michael Sillers, MD, FARS

“From Nasal Astronomer to Skull Base Surgeon and Beyond: How Innovation and Collaboration Have Launched Modern Rhinology”

*Session Moderators: Garret Choby, MD, FARS;
Chris Davis, MD, FARS*

10:31 am – 10:37 am

Ablation therapies for chronic rhinitis: A randomized comparative study

Benjamin Bernard, MD

Carine Tamamian, BS

Jennifer Lee, BS

Lance Gripenstroh, MSN

Carol H. Yan, MD

University of California, San Diego School of Medicine

Background:

Chronic rhinitis affects approximately 30 million Americans. In-office posterior nasal nerve (PNN) ablation procedures, including radiofrequency ablation and cryotherapy, are well tolerated and effective, yet no prospective comparisons between modalities exist.

Methods:

Adults (≥ 18 years) with chronic rhinitis were randomized to PNN ablation with RhinAer, Clarifix, or Neuromark at a tertiary academic center. TNSS, SNOT-22, and SNOT-8 (rhinologic subdomain) were collected at baseline, 1, and 3 months. Outcomes were analyzed using linear mixed-effects models adjusting for baseline. Within-group improvement was assessed using mean change from baseline. Exploratory subgroup analyses examined the effect of chief nasal complaint.

Results:

Forty-two patients completed treatment (RhinAer n=14, Clarifix n=18, Neuromark n=10; mean age 59.0 years). All showed clinically significant within-group improvements in TNSS, SNOT-22, and SNOT-8 at both follow-up timepoints. At 3 months, mean reductions ranged from 28-49% for TNSS, 28-57% for SNOT-22, and 36-50% for SNOT-8 with large effect sizes (Cohen's $d > 0.8$). In mixed-effects analysis, there was no significant difference

between treatment groups, indicating similar outcomes across devices. Exploratory subgroup analyses suggested differences in TNSS by chief complaint, with RhinAer associated with lower scores in patients with rhinorrhea and Neuromark in those with post-nasal drip and congestion. However, these differences were not significant after adjustment for multiple comparisons.

Conclusions:

All three PNN ablation treatments demonstrated comparable overall effectiveness. Treatment response may be influenced by a patient's chief nasal complaint, warranting further studies.

10:38 am – 10:44 am

Real world outcomes of posterior nasal nerve ablation across multiple devices

Akshay Prabhakar, BSA

Justina R. Varghese, BA

Shalini Namuduri, BS

Franklin Wu, MD

Stephanie Camey, Ms.

Masayoshi Takashima, MD, FARS

Omar Ahmed, MD, FARS

Houston Methodist

Introduction:

Posterior nasal nerve ablation (PNNA) is increasingly used for chronic rhinitis refractory to medical therapy, yet non-industry sponsored long-term outcome data remain limited. This study evaluates the overall effectiveness of PNNA and compares patient-reported outcomes across commercially available devices.

Methods:

Patients who underwent PNNA between 2020-2025 at a tertiary center were surveyed by telephone to assess Total Nasal Symptom Score (TNSS), perceived improvement, and symptom durability. Benefit was defined as $>30\%$ TNSS reduction for >12 months. Analysis was performed with Kruskal-Wallis and Chi-square tests.

Results:

Of the 108 patients surveyed, 61 were treated with RhinAer, 37 with ClariFix, and 10 with Neuromark. Baseline demographics and TNSS were similar between groups. Overall, 71% of patients reported initial symptom improvement after PNNA, with 52% maintaining benefit for at

PROGRAM ABSTRACTS

least 12 months. RhinAer demonstrated higher rates of initial improvement compared to ClariFix (85% vs. 51%, $p < 0.001$). Benefit lasting >12 months was achieved in 62% of RhinAer patients compared to 38% of ClariFix patients ($p = 0.032$). Neuromark sample size was too small for statistical comparisons. Among 37 patients with symptom recurrence, 17 (46%) experienced benefit for >12 months before recurrence. These patients were significantly more likely to desire repeat procedure than those with early recurrence (71% vs 5%, $p < 0.001$).

Conclusions:

This represents the first non-industry sponsored comparative study of PNNA devices, with real-world outcomes differing from industry trials. RhinAer demonstrated superior outcomes compared to Clarifix, and the limited Neuromark data preclude definitive conclusions for this device at this time.

10:45 am – 10:51 am

Clinical outcomes after repeat posterior nasal nerve interventions

Justina R. Varghese, BA
Akshay Prabhakar, Mr.
Yixuan Zheng, Dr.
Stephanie Camey, Ms.
Masayoshi Takashima, MD, FARS
Omar Ahmed, MD, FARS
Houston Methodist Hospital

Background:

Posterior nasal nerve interventions have been studied to improve symptoms in chronic rhinitis patients, with limited evidence on outcomes after multiple posterior nasal nerve procedures.

Methods:

A retrospective review at a tertiary academic medical center (2021-2025) of patients who underwent at least two posterior nasal nerve interventions, including in office (RhinAer, ClariFix, Neuromark) and surgical (Posterior Nasal Neurectomy (PNN), Vidian Neurectomy (VN)) procedures. Pre- and post-procedure TNSS scores were assessed via Wilcoxon signed-rank tests. Responders were defined as a >30% TNSS reduction, reported as median [IQR].

Results:

30 patients were included; initial procedures were RhinAer (n=15), ClariFix (n=11), Neuromark (n=3) and Vidian Neurectomy (n=1). Median time to second intervention was 10.0 months [5-23]. For second interventions, surgical neurectomy demonstrated an 82% (9/11) responder rate, vs. 47% (9/19) for in-office procedures. In patients who underwent RhinAer as the second procedure (n=10), the median TNSS reduction was 1.5 points [1-4], $p = 0.008$. For PNN (n=8) as the subsequent intervention, median TNSS reduction was 4 points [3-5.5], $p = 0.02$. ClariFix (n=6), Neuromark (n=3) and VN (n=3) as repeats showed no significant incremental improvements.

Conclusion:

Existing literature primarily reports outcomes after an initial posterior nasal nerve intervention. This study found repeat posterior nasal nerve interventions demonstrated lower response rates than those previously described for initial procedures. Radiofrequency ablation and surgical neurectomy may be appropriate options after initial treatment. Further studies are needed to inform treatment sequencing.

10:52 am – 10:58 am

Transoral neuromodulation for the treatment of nasal congestion

Abhiram Cherukupalli, MD, MHSc, MSE
Oriol Cuxart, Bioengineering Fellow
Sandhya Tikku, Bioengineering Fellow
Nicholas Rowan, MD

Objective:

Chronic sinonasal disease is multifactorial, with contributions from inflammatory and neurogenic mechanisms often remaining refractory to standard medical and surgical therapies. The role of autonomic dysfunction and neuromodulation has been discussed where therapeutic potential has been seen in other anatomical systems. We aimed to assess the feasibility of a novel transoral stimulation method to target sinonasal autonomic pathways.

Methods:

Patients with chronic sinonasal disease and a chief complaint of nasal congestion were recruited. Pre-stimulation Visual Analog Scale (VAS), Nasal Obstruction Symptom Evaluation

PROGRAM ABSTRACTS

(NOSE) and Peak Nasal Inspiratory Flow (PNIF) were collected. A custom molded mouthguard was created for each patient with a monopolar circuit design and stimulation electrode localized to the incisive foramen. Stimulation was performed at 1mA for 2 min. VAS, NOSE and PNIF were collected immediate post-stimulation and at 5 hours post-stimulation.

Results:

20 participants were recruited. 11 had a diagnosis of Chronic Rhinitis. VAS decreased from 13.4 to 8.4 ($p = 0.002$) and NOSE decreased from 46 to 25.25 post-stimulation ($p = 0.0003$). Pre- and post-stimulation PNIF were 94.76 and 104.11 respectively ($p = 0.09$). Subgroup analysis in chronic rhinitis patients demonstrated a mean reduction in VAS and NOSE of 5.36 ($p = 0.05$) and 19.1 ($p = 0.02$) respectively. PNIF increased from 86 to 93.9 post-stimulation ($p = 0.26$).

Conclusion:

Transoral neuromodulation achieved rapid, significant reductions in VAS and NOSE scores within minutes of stimulation. This immediate clinical response provides the first evidence for non-invasive, autonomic neuromodulation in the management of chronic sinonasal symptoms in humans.

10:59 am – 11:05 am

A novel non-invasive wearable nasal aid to relieve nasal obstruction symptoms among broad patients

Kai Zhao, PhD

Kanghyun Kim, Graduate Student

Zhenxing Wu, Postdoc

Veronica Formanek, Medical Student

Shivani Patel, BA

Lauren Gastineau, BS

Joanne Xu, Medical Student

Nidhi Jha, MD PhD Student

Kathleen Kelly, MD

Bradley Otto, MD

The Ohio State University

Introduction:

Nasal obstruction affects approximately 13% of the population. Yet, subjective complaints of obstruction often correlate poorly with objective measures such as nasal resistance, contributing to suboptimal treatment outcomes.

Methods:

We invented non-invasive wearable nasal aid containing embedded diagonal air channel to redirect nasal airflow and applied to two distinct patient groups: empty nose syndrome (ENS; $n = 56$) and inferior turbinate hypertrophy with or without septal deviation ("septo-turb"; $n = 36$). ENS is a rare, debilitating disorder characterized by a paradoxical sensation of obstruction despite a widely patent nasal cavity. In contrast, septo-turb patients present clinically constricted airway.

Results:

Both distinct patients groups (nose "too-wide" or "too-narrow") reported significant symptom improvement over baseline (ENS6q: baseline 16.41 ± 4.61 , aid downwards 11.59 ± 5.93 , upwards 12.23 ± 5.74 , self-oriented 9.85 ± 5.95 , $p < 0.05$; Septo-turb VAS of nasal obstruction: baseline 5.78 ± 2.05 , down 4.15 ± 2.81 , self-oriented 3.56 ± 2.51 , $p < 0.05$), especially in the self-selected orientation, with 64.3% ENS and 63.9% septo-turb patients below the normative cutoff, suggesting that symptom relief depends on individualized airflow stimulation of critical nasal mucosa regions. CT based computational fluid models further confirmed nasal plug's effectiveness in re-directing airflow to targeted intranasal regions.

Conclusion:

These results challenge the traditional view of nasal obstruction as primarily a mechanical obstruction and may lead to novel therapeutic approaches focusing on optimal air/mucosa stimulation rather than on resistance reduction alone.

11:06 am – 11:10 am

Q&A

11:10 am – 12:00 pm

PANEL: "Everything I Need to Know That I DIDN'T Learn in Kindergarten...or Residency...or Fellowship"

Moderator: Tran Locke, MD, FARS

Panelists: Kara Detwiler, MD, FARS; Leah Hauser, MD, FARS; Michael Kohanski, MD, PhD, FARS; Tyler Merrill, MD

12:00 pm

Meeting Concludes

PROGRAM ABSTRACTS

Saturday, October 17, 2026

Breakout 1

Emerald Room

8:00 am – 12:00 pm

8:00 am – 8:30 am

The Nose Knows: Clues to Autoimmune Disease in Rhinology

Speaker: Meghan Norris, PA-C

8:30 am – 8:35 am

Q&A

8:35 am – 9:00 am

AERD: Aligning Surgical and Medical Care for Optimal Outcomes

Speaker: Christine Reger, ANP-C; Samantha Roecker, MSN, FNP-C

9:00 am – 9:05 am

Q&A

9:05 am – 9:35 am

Break with Exhibitors in Regency

9:35 am – 10:05 am

Nose-talgia: Turning the Page on Chronic Rhinitis

Speaker: Jane Wang, FNP-C

10:05 am – 10:10 am

Q&A

10:10 am – 11:00 am

Updates on Olfactory Dysfunction

Speaker: Alyssa Acevedo

11:00 am – 11:05 am

Q&A

11:05 am – 12:00 pm

Panel: “It Takes a Team: APPs and Rhinologists in Contemporary Practice”

Moderator: Emily Moldoff, FNP-C

Panelists: Farhoud Faraji, MD; Leslie Gomez, FNP-C; James Palmer, MD, FARS; Christine Reger, ANP-C

12:00 pm

Meeting Concludes

POSTERS

Posters

Room: Regency

5:00 pm – 6:30 pm

Poster Mentorship Session**“The Future of Rhinology, One Poster at a Time: Pearls from the Pros”**

Room: Regency

Moderator: Christopher Roxbury, MD, FARS

The American Rhinologic Society is pleased to introduce the Poster Mentorship Session. This new event will bring trainee poster presenters together with experienced rhinologists in small-group discussions led by ARS member mentors. Trainees will present their research, receive personalized feedback, and connect with peers and faculty in a collaborative environment that promotes mentorship, professional development, and networking. The reception reflects the ARS commitment to education, scholarship, and the development of future leaders in rhinology. We look forward to welcoming trainees, mentors, and members to this exciting event.

Poster #A001

A case report of total lower lip reconstruction using bilateral nasolabial flap: A sandwich technique

Vishwadeep Khidiya, MS

Jaideep Singh Chouhan, Dr.

Dr S. N. Medical College

Introduction:

The lips serve vital roles in speech, chewing, and expression, and are frequent sites for squamous cell carcinoma. Surgical excision often leads to complex defects requiring meticulous reconstruction. The nasolabial flap, due to its versatility and reliability, is preferred for large lip defects, especially in elderly patients with comorbidities. This case highlights the functional and aesthetic success of a bilateral musculocutaneous nasolabial flap in total lower lip reconstruction.

Material & Methods (Case Study):

A 56-year-old male with multiple comorbidities presented with an ulcerated exophytic lesion

involving the entire lower lip. Radical excision and bilateral supraomohyoid neck dissection were performed under general anesthesia, resulting in a full-thickness lower lip defect. Reconstruction utilized two pedicled musculocutaneous nasolabial flaps (7 cm each) rotated and transposed into the defect using a sandwich technique, preserving the modiolus and ensuring mucosal stability via a mucosal sling.

Results:

Postoperative recovery was uneventful with no complications. The patient maintained oral competence and satisfactory cosmetic results. Functional restoration, including speech and eating, was preserved.

Conclusions:

The bilateral musculocutaneous nasolabial flap offers a simple, reliable, and time-efficient method for total lower lip reconstruction. It provides excellent aesthetic and functional outcomes, making it especially suitable for elderly patients with comorbidities.

Poster #A002

A multidisciplinary surgical approach for complex lateral frontal inverted papilloma

Janice Chung, MD

Rory Lubner, MD

Jivianne Lee, MD, FARS

UCLA

Introduction:

Inverted papillomas (IP) are common benign tumors of the nasal cavity and paranasal sinuses. This case report highlights a multidisciplinary approach to a complex frontal sinus IP.

Methods:

A 61 y.o. male with left-sided retro-orbital pain, nasal obstruction, and blurred vision presented with inverted papilloma (IP) of the left frontal sinus with concern for orbital roof involvement.

Results:

The patient underwent a combined transorbital and endonasal resection of the IP with the Rhinology and Oculoplastic teams. The anterior table window from above and the transnasal Draf IIB septal window from below were utilized to complete the resection. The IP was systematically resected and traced to its

POSTERS

attachment site at the superior-most aspect of the lamina, at the junction of the orbital roof. The tumor, underlying mucosa, involved lamina, and superolateral periorbital were removed as indicated by positive frozen section. The lesion was completely resected along the sites of attachment. The patient experienced symptomatic improvement. On follow-up MRI, there was concern for recurrence of the lateral frontal sinus and supraorbital rim. Rhinology, Oculoplastics, and Neurosurgery performed a combined, left anterior frontal table osteotomy for access to the lateral aspect of the frontal sinus, left lateral orbitotomy for removal of supraorbital rim, and endoscopic endonasal approach to identify the IP in the orbital rim and posterolateral frontal sinus. The tumor and mucosa were completely removed and the sites of attachment were burred down.

Conclusions:

This case report presents the potential complexity of lateral frontal sinus IPs and highlights the value of a multidisciplinary surgical approach in optimizing access.

Poster #A003

A new incisionless technique to manage depressed frontal sinus fracture

Mohsen Naraghi, MD
Orphans Worldwide

Introduction:

The frontal sinus is an important part of the skull structure, providing protection and insulation for the brain. However, fractures in this area can be complex and challenging to treat. In this article, we describe a novel technique for the reconstruction of a frontal sinus fracture that minimizes the risks associated with conventional approaches.

Surgical technique:

A 25-year-old male patient came to the ENT office four days after a car accident. Clinical examination showed depression of the forehead in the right supraorbital region. Three-dimensional CT reconstruction of the face evidenced a comminuted fracture of the anterior wall of the frontal sinus on the right side. The posterior frontal sinus wall was intact. The axial view revealed an obviously depressed frontal fracture with an air leak under the periosteum through bony segment gaps.

Through a small (5 mm) sub-brow incision, a freer elevator was inserted beneath the fractured fragments to elevate them. A 16-gauge venous catheter was then introduced horizontally from the medial aspect of the bone, exiting at the lateral side. Following this, a 24-gauge wire was threaded through the catheter, which was subsequently removed. The same procedure was applied vertically, with the catheter introduced from the inferior to the superior portion, and the same wire was again placed.

Result:

The patient had no symptoms of sinusitis and maintained a good cosmetic outcome at the one-year follow-up.

Conclusion:

In conclusion, this innovative procedure highlights the potential for creative solutions to complex clinical problems in facial reconstructive surgery.

Poster #A004

A novel minimally invasive balloon septoplasty for nasal airway obstruction

Nathan Barefoot, BS
Elena Quinonez Del Cid, BS
Priya Desai, BS
Katrina Bootes, BS
Jackson Vuncannon, MD
Cristine Klatt-Cromwell, MD
Brent Senior, MD, FARS
Brian Thorp, MD, FARS
Charles Ebert, MD, FARS
Adam Kimple, MD, PhD, FARS
UNC Chapel Hill

Background:

Nasal airway obstruction (NAO) affects 30-50% of the population and significantly impairs quality of life. Septoplasty with inferior turbinate reduction is an effective treatment but is invasive with prolonged recovery. This study evaluates the efficacy of the TRACT balloon dilation system (Acclarent Inc., Irvine, CA), a recently approved minimally invasive NAO treatment.

Methods:

Patients undergoing TRACT balloon dilation with inferior turbinate reduction for NAO were enrolled. All dilations were performed in the operating room; the balloon was fitted into each nare and inflated to 8 atmospheres for 30 seconds. NOSE, SNOT-22, peak nasal

POSTERS

inspiratory flow (PNIF), and UPSIT were completed preoperatively and at 1-3 months post-operation. Paired t-tests assessed significance.

Results:

Three patients underwent the procedure and completed all preoperative and follow-up activities. NOSE scores significantly improved from 14.0 (SD 1.0) to 4.7 (1.2) ($p=0.009$). SNOT-22 scores improved by 25.7 (6.7) ($p=0.022$). PNIF trended toward improvement (mean change 56.7 L/min [50.3], $p=0.191$). Mean UPSIT correct change was not significant (2.7 points [3.2], $p=0.287$).

Conclusion:

These preliminary data demonstrate that TRACT balloon septoplasty with inferior turbinate reduction produces significant improvements in validated symptom outcomes, most notably a mean 9.3-point improvement in NOSE scores. These findings support this device's promise as a minimally invasive alternative to traditional septoplasty; enrollment is ongoing to further establish efficacy.

Poster #A005

Adverse events associated with external nasal dilator use: Analysis of the MAUDE database

Nolan Holbrook, BS
Brian Benson, MD

Background:

Nasal dilators (NDs) are simple over-the-counter products used to improve breathing for nasal obstruction, sleep, and exercise. Although NDs are considered low risk, adverse events (AEs) associated with these products have been reported. This study aims to characterize the safety profile of external NDs through the analysis of AEs reported to a national database.

Methods:

The Manufacturer and User Facility Device Experience (MAUDE) database was searched with product code LWF (nasal dilator) from January 2016 through March 2026. Data fields and narrative event descriptions were reviewed in each report for categorization and analysis.

Results:

88 total medical device reports represented 79

unique AEs. Events were primarily classified as injury (75, 94.9%), with only two device malfunctions reported (2.5%). Annual reporting peaked in 2016 ($n=20$), declined steadily through 2023 ($n=1$), and rebounded in 2024 ($n=7$). All reports involved externally applied adhesive strips. Skin trauma from adhesive injury or product removal was the most common AE ($n=30$, 38.0%), including skin removal, bruising, burns, and bleeding. Allergic reactions and skin irritation accounted for 22 events (27.8%), including two cases of anaphylaxis requiring emergency intervention. Seven reports (8.9%) involved nasal skin cancer descriptions or precancerous lesions and four described infection or cellulitis (5.1%). Thirty-four patients (43.0%) sought medical attention.

Conclusion:

This analysis identifies a range of reported AEs associated with external NDs. Since these products are often thought of as benign, serious events including anaphylaxis and trauma highlight the importance of informed patient counseling.

Poster #A006

Aesthetic-functional rhinoplasty paradox Gaity Wahab, BS

Background:

Rhinoplasty is increasingly performed to achieve both aesthetic refinement and functional improvement. However, in contemporary practice, a subset of patients report persistent or worsening subjective nasal obstruction despite objectively successful and aesthetically favorable outcomes. This review addresses the growing clinical gap between cosmetic success and long-term functional respiratory dissatisfaction in modern rhinoplasty.

Methods:

A narrative review of PubMed-indexed literature (2016–2026) was conducted. Studies evaluating patient-reported outcomes, nasal airflow measurements, postoperative satisfaction, and long-term functional results after aesthetic rhinoplasty were included. Both objective and subjective outcome measures were analyzed.

POSTERS

Results:

Objective measures demonstrate improved airflow, with reductions in nasal airway resistance of approximately 10–30% and increases in minimal cross-sectional area from ~0.4–0.6 cm² to 0.6–0.8 cm². Patient-reported outcomes show mean NOSE score improvements of 30–50 points; however, 10–25% of patients report persistent or recurrent obstruction symptoms despite favorable objective findings. Computational modeling suggests altered airflow distribution, increased local velocity, and turbulence at the internal nasal valve may affect mucosal cooling and airflow perception. These findings highlight a mismatch between objective airflow improvement and subjective breathing experience.

Conclusion:

Persistent subjective nasal obstruction may occur despite objective and aesthetic success following rhinoplasty. This paradox emphasizes the necessity of outcome models integrating both airflow metrics and patient perception.

Poster #A007**AI assisted turbinate reduction for surgical planning**

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Surgical planning for turbinate reduction candidates has few objective statistics due to the complexity and individual variability of the airway. This study developed an AI assisted software package for objective and personalized reduction for patient specific surgical planning. An automatic multiclass 3D turbinate CNN was trained upon 25 patient CTs with pre-identified inferior turbinates. With patient specific turbinate tissue and bone defined, a volumetric reduction algorithm was implemented to automatically regress turbinate tissue towards the turbinate bone. Reduction magnitude is user-defined as a function of anterior-posterior position. Algorithm performance was then tested on CTs from 11 additional patients with chronic turbinate hypertrophy, and compared with their actual

postoperative CTs. Optimizing for multi-class Dice loss, automatic turbinate bone and tissue segmentation saw strong training (DSC = 0.9362) and testing performance (DSC = 0.9401 ± 0.08), indicating strong alignment with expert delineation. Volumetric reduction algorithm parameters were optimized to maximize visual similarity to resected volumes. Virtual and postoperative airway reconstructions demonstrated strong geometric agreement via Hausdorff distance (1.88 mm), SSIM (0.921), and cross-sectional area comparison (p = 0.886). The software produced clinically realistic and valuable statistics, and its implementation could assist physicians in objective and personal surgical planning for turbinate resection.

Poster #A008**AI versus physician diagnosis and management in rhinology**

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Introduction:

Artificial intelligence (AI) symptom intake tools have shown strong diagnostic performance in prior studies, but their performance in real-world, undifferentiated clinical settings remains unclear. We evaluated differences between AI-generated and physician diagnoses and management in a rhinology clinic.

Methods:

In this prospective observational study, adults presenting for initial evaluation in an outpatient rhinology clinic between March and April 2026 completed an AI-guided symptom intake using a commercially available platform. The treating physician was blinded to AI output.

AI-generated diagnoses and management recommendations were compared to physician assessment. Diagnostic performance was assessed based on agreement in the primary diagnosis and overlap between differential diagnoses. Differences in management decisions were evaluated across medications, nasal endoscopy, CT imaging, and laboratory testing using McNemar's test.

Results:

Nineteen patients were included; mean age was 48.3 ± 14.4 years, 58% were male, and

POSTERS

47% presented with a chief complaint of nasal obstruction. AI matched the physician's primary diagnosis in 52.6% of cases, with 78.9% overlap in differential diagnoses. Compared to physicians, AI more frequently recommended medications (94.7% vs 73.7%, $p=0.046$), imaging (94.7% vs 15.8%, $p<0.001$), and laboratory testing (89.5% vs 0%, $p<0.001$), with less frequent recommendation for endoscopy (27.8% vs 100%, $p<0.001$).

Conclusion:

In a real-world, undifferentiated clinical setting, AI showed modest diagnostic performance but differed in management decisions, with more frequent recommendations for imaging and laboratory testing and fewer recommendations for nasal endoscopy at initial evaluation.

Poster #A009

AI-based morphometric outcomes in rhinoplasty: Systematic review and meta-analysis

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Purpose:

Rhinoplasty outcome assessment relies on subjective judgment and qualitative photographic comparison with poor inter-rater reliability. AI may standardize this through automated morphometric quantification. This systematic review and meta-analysis evaluate accuracy, reproducibility, and expert agreement of AI models for morphometric measurement in rhinoplasty.

Methods:

PubMed/MEDLINE, IEEE Xplore, Scopus, and Cochrane Library were searched through January 2025. Included studies applied AI to 2D or 3D images for quantitative post-rhinoplasty morphometric measurement. Twelve studies (2018-2025; $n=23,300$) met criteria. Bias was assessed via modified QUADAS-AI. Random-effects meta-analysis was performed for continuous error metrics; classification accuracy was summarized descriptively.

Results:

AI achieved pooled accuracy of 76.7% (95% CI: 65.2-88.2%), with 3D models outperforming 2D (84.5% vs. 69.2%). Mean landmark error was 1.38 mm (95% CI: 0.94-1.82 mm). Reproducibility was high (ICCs: 0.72-0.96), exceeding human inter-rater reliability (0.60-0.85). AI-surgeon agreement was 68.4% (95% CI: 64.9-71.7%), lower than inter-surgeon agreement at 77.3% ($p<0.0001$). Sensitivity analysis excluding high-bias studies ($n=3$) yielded 78.9% with reduced heterogeneity ($I^2=71\%$ vs. 82%). GRADE certainty was low.

Conclusion:

AI shows high reproducibility and approaching accuracy for morphometric quantification in rhinoplasty, particularly with 3D imaging. AI does not yet replicate integrative surgeon judgment, and evidence is limited by methodological heterogeneity, single-center datasets, and absent prospective validation. Translation requires standardized endpoints, multicenter trials, and integration with patient-reported outcomes.

Poster #A010

AI-generated versus traditional patient education materials in rhinologic surgery

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Objective:

To evaluate whether AI-generated patient education materials improve comprehension, satisfaction, and information retention compared to traditional American Rhinologic Society (ARS) handouts in patients undergoing rhinologic surgery.

Methods:

We conducted a prospective, randomized, double-blinded study of patients undergoing endoscopic sinus surgery, septoplasty, and/or turbinate reduction. Participants were randomized to receive either AI-generated educational materials or standard ARS handouts at their preoperative visit. AI-generated materials were created de-novo using ChatGPT and reviewed by four fellowship-trained rhinologists to ensure clinical accuracy and appropriate reading level. Patients completed preoperative and 3-week postoperative surveys assessing their baseline knowledge and satisfaction with

POSTERS

the educational materials in adequately preparing them for surgery and the recovery period. Primary outcomes included patient-reported clarity, usefulness, and overall satisfaction with the materials. Secondary outcomes included patient anxiety, handout readability, and recall of perioperative instructions.

Results:

Forty patients have been enrolled to date (20 controls, 20 intervention). Preliminary analysis demonstrates that patients receiving AI-generated materials report higher satisfaction, improved readability, and greater perceived retention of key postoperative instructions compared to traditional ARS handouts. AI-generated materials were also consistently rated as more concise and easier to understand.

Conclusion:

Preliminary findings suggest that AI-generated educational materials may offer a scalable and simple strategy to enhance patient understanding and satisfaction in rhinologic surgery.

Poster #A011

Air quality and epistaxis emergency department visits

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During periods of poor air quality, including regional wildfire events, clinicians have noted a perceived increase in emergency department visits for epistaxis. Although air pollution is known to irritate and inflame the respiratory epithelium, epistaxis is not commonly recognized as one of its health effects, suggesting a gap in current understanding.

This retrospective cohort study includes patients presenting to two tertiary care emergency departments between 2020 and 2023 with a primary diagnosis of epistaxis. Patients presenting during periods of poor air quality attributable to Canadian wildfires are compared with those presenting during a matched time period with lower ambient air pollution levels. Chart review identified patients

with epistaxis using ICD-10 and CPT codes. Demographic and clinical data have been collected, with ongoing analyses assessing correlations with Air Quality Index (AQI), pollutant data, and lag times from 0 to 5 days.

To date, 734 patients have been identified during this time period. Presentations were predominantly atraumatic and spontaneous, with anterior bleeds comprising the majority of cases. The majority of patients were managed with local measures, including various types of nasal packing and local cautery. Despite the high volume of visits, hospital admission was rare.

Analysis of air quality data is ongoing but thus far shows a trend toward higher rates of presentation during periods of poor air quality. Ongoing analysis will further evaluate the association between air quality metrics and epistaxis incidence, with the goal of identifying potential environmental contributors and informing preventive strategies.

Poster #A012

Analysis of comorbidities in olfactory dysfunction

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Background:

Prior investigation on the etiologies of olfactory dysfunction have been limited by sample size and selection bias. There remains a lack of large-scale, primary analyses examining the spectrum of diseases associated with olfactory dysfunction. Therefore, the purpose of this study is to examine the prevalence of conditions known to be associated with olfactory dysfunction in a large scale analysis.

Methods:

The TriNetX Research Network was queried to construct a cohort of adults with diagnosed olfactory dysfunction (as defined by ICD-10 codes for anosmia or parosmia). The primary measured outcome was the prevalence of sinonasal inflammatory disorders, post-viral infections, post-traumatic conditions, neurodegenerative diseases, and sinonasal/skull-base tumors in this population.

Results:

A total of 138,894 adults with anosmia and

POSTERS

55,564 with parosmia were included. In the anosmia cohort, 43% were diagnosed with chronic rhinosinusitis (CRS) with or without nasal polyps, 31% with a previous viral URI, 8% with neurodegenerative diseases, 4% were diagnosed with sinonasal/skull-base tumors, and 4% diagnosed after traumatic brain injury. In the parosmia cohort, rates were similar within 2%. More than half of the individuals with CRS and neurodegenerative diseases were diagnosed with anosmia/parosmia prior to diagnosis of these conditions.

Conclusions:

Sinonasal inflammatory disorders were the most common comorbid conditions in adults with anosmia and parosmia, followed by post-viral infections, neurodegenerative diseases, and sinonasal/skull-base tumors. This data supports the theory that a significant portion of olfactory dysfunction previously identified as idiopathic may actually be related to neurodegenerative disease.

Poster #A013

Analyzing temporal variations in SNOT-22 scores prior to otolaryngology clinic visits

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The Sino-Nasal Outcome Test (SNOT-22) is a validated patient-reported outcome measure for sinonasal disease. There is no current consensus on optimal timing for SNOT-22 completion relative to clinic visits. This study aims to evaluate whether proximity of SNOT-22 completion to an initial clinic visit impacts reported scores in new patients with sinonasal complaints. We hypothesize SNOT-22 scores vary with time interval differences and may exceed the Minimally Clinically Important Difference (MCID).

This is a retrospective observational study. Patient population includes adults who complete two SNOT-22 forms (1 electronically and 1 on paper) prior to their first visit at a rhinology clinic in an urban area. Collected data includes timing of each SNOT-22 relative to clinic visit and SNOT-22 total scores.

30 patients were included in preliminary review. Mean SNOT-22 score was 28.0 (SD 16.5). Mean change in score was 1.43 (SD 11.9), $t =$

0.66, $p = 0.52$, Cohen's $d = 0.12$. 11 of 30 patients had a change in score >8.9 (MCID). Multivariable regression showed $R^2 = 0.24$; adjusted $R^2 = 0.15$, standard error = 11.0. Higher SNOT-22 score was associated with score change ($\beta = 0.31$, $p = 0.016$), while time between surveys and proximity to visit date were not significant ($p = 0.85$ and $p = 0.17$, respectively).

SNOT-22 scores vary over time for patients without any interventions. Data suggests higher initial SNOT-22 scores are associated with increased variation in repeat survey results, while timing of survey completion relative to clinic visit does not significantly contribute. Findings convey stability of symptom burden over time and suggest that variations in timing are unlikely to bias patient-reported outcomes in this context.

Poster #A014

Antifungal treatment & survival outcomes in invasive fungal sinusitis

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Invasive fungal sinusitis (IFS) is a life-threatening infection, with a mortality rate of at least 50%. To determine whether antifungal type, administration route, or treatment strategy impacts survival, we completed a retrospective analysis of 54 IFS patients. Antifungal exposures analyzed included IV therapy, oral therapy, prophylaxis, and maintenance regimens. 18 separate comparisons were performed using log-rank testing and Mantel-Haenszel hazard ratios. Antifungal treatment was near-universal: 79.6% received IV antifungals, 75.9% received oral antifungals, and 66.7% received multiple agents. Systemic antifungal treatment was strongly associated with greater pathological extent ($p=0.002$). No antifungal comparison reached statistical significance (all $p>0.20$). Hazard ratios centered near 1.0 with wide confidence intervals. Prophylactic amphotericin B showed numerically favorable outcomes (45% mortality vs 76% for prophylactic azoles, median OS not reached vs 153 days), though not statistically significant ($p=0.67$). Patients receiving multiple antifungal agents had higher mortality (72% vs

POSTERS

50%, HR=1.24, p=0.64), likely reflecting confounding by disease severity. In this uniformly treated cohort, no antifungal regimen demonstrated statistically significant survival benefit. Near-universal treatment (>75% receiving both IV and oral antifungals) limited statistical power for detecting differences. The apparent survival disadvantage with more intensive therapy may represent more advanced or extensive disease. Pathogen-stratified analysis and treatment timing data are required to meaningfully compare antifungal efficacy in IFS.

Poster #A015

Asymptomatic isolated sphenoid sinusitis

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Background:

Isolated sphenoid sinusitis (ISS) describes a clinical finding of disease exclusively involving the sphenoid. Existing literature focuses on symptomatic patients. Long-term outcomes of patients with asymptomatic ISS are under-reported.

Objective:

To assess long term outcomes for patients diagnosed with asymptomatic ISS.

Methods:

This retrospective study utilized electronic records from a tertiary care hospital. Included patients had radiologic findings of ISS identified between Jan 2017 and Dec 2019. Follow-up data was collected until Dec 2024.

Results:

204 patients were included with an average age of 67.8. The most common reasons for initial scan were trauma (22.5%), malignancy (11.8%), and altered mental status (AMS) (10.3%). CT was the initial modality in 66.7% of cases. Fifty-six (27%) were referred for ENT evaluation. One-hundred nineteen patients had a follow-up scan an average of 403 days after initial diagnosis. Forty-seven (40.5%) patients demonstrated resolution of disease. Resolution was seen in 32% (8/25) of trauma patients, 55% (10/18) of patients followed for malignancy, and 33% (4/12) of patients with AMS. Four patients underwent sinus surgery with two cases of mycetoma, one with

ophthalmoplegia and purulence, and one with resolved disease. During the follow-up period 39 patients expired of which one exhibited possible complications due to sphenoid sinusitis from cavernous sinus thrombosis in the setting of septic shock and cerebrovascular accident.

Conclusion:

Long-term outcomes of asymptomatic ISS are under-reported in the current literature. This study highlights overall favorable non-surgical outcomes but low ENT referral rate for patients with asymptomatic ISS.

Poster #A016

WITHDRAWN

Poster #A017

Automated segmentation-guided estimation of skull base slope angles using deep learning

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Background:

Sagittal skull base (SB) slope—the angle between the anterior skull base (ethmoid roof/cribriform plate) and the hard palate on sagittal imaging—is a key anatomic determinant of iatrogenic cerebrospinal fluid (CSF) leak risk during endoscopic sinus surgery. Prior studies suggest SB slope may be the most important predictor of skull base vulnerability. However, fewer than five studies have rigorously evaluated this relationship due to challenges in standardization and labor-intensive manual measurement.

Methods:

A deep learning-enabled computational framework was developed to estimate sagittal SB slope angles from CT imaging. Using a previously validated model with high-fidelity segmentation of the frontoethmoid complex (Dice >0.90), the system automatically extracts

POSTERS

skull base anatomy and generates spatial representations of the cribriform plate, ethmoid roof, and hard palate. These are integrated within a geometric inference pipeline to compute right, left, and midline sagittal SB angles. A data-driven calibration step was applied to align predictions with expert-derived measurements. The framework was evaluated on 20 CT scans with manual reference measurements.

Results:

On a held-out test set, mean absolute error (MAE) was 3.19° (right), 1.97° (midline), and 3.16° (left). Performance was highest for midline measurements, with slightly reduced accuracy for lateralized angles, consistent with increased anatomic heterogeneity.

Conclusions:

Automated estimation of sagittal SB slope using deep learning-derived segmentation is feasible and accurate. This approach enables standardized, scalable assessment of an underutilized anatomic risk factor and supports integration of AI-derived metrics into preoperative risk.

Poster #A018

Ballistic gel model for preclinical assessment of eustachian tube dilation safety

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Objective:

To describe and evaluate a novel ballistic gel phantom model for preclinical assessment of intraluminal navigation and false-passage risk during Eustachian tube dilation.

Study Design:

Bench-top phantom model study.

Methods:

A reproducible ballistic gel phantom incorporating a curved intraluminal pathway simulating the cartilaginous Eustachian tube was constructed. A pre-shaped 2.7 mm wire was embedded during gel polymerization and

removed to create a concealed lumen, blinding the operator to internal geometry. Three dilation device categories were evaluated: (1) flexible catheter-based system requiring axial advancement (Flex), (2) rigid-shaft system with balloon advancement along a fixed shaft (Rigid), and (3) novel everting balloon platform (EV). Testing was performed by a senior otolaryngologist. Each phantom underwent five passes per device. Phantoms were sectioned longitudinally to visualize device trajectory. Outcomes were classified as pathway fidelity or false-passage formation.

Results:

For the Flex group, deviation from the lumen occurred in 3/5 trials at the 15° curvature, with lateral wall breach. For the Rigid group, deviation occurred in 4/5 trials with penetration from the proximal segment prior to curvature. The EV group followed the lumen without secondary tract formation in all trials. No indeterminate outcomes were observed.

Conclusions:

This ballistic gel model provides a reproducible, blinded platform for assessing intraluminal navigation behavior and false-passage risk across Eustachian tube dilation devices and may complement existing preclinical testing methods.

Poster #A019

Bevacizumab reduces epistaxis-related ablation burden in hereditary hemorrhagic telangiectasia

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Background:

Hereditary hemorrhagic telangiectasia (HHT) is a rare vascular disorder characterized by recurrent epistaxis that often necessitates repeated surgical ablation. Systemic bevacizumab has emerged as an effective

POSTERS

treatment for severe or refractory HHT-related epistaxis, yet its impact on epistaxis-related surgical frequency is not well defined.

Methods:

A retrospective cohort study was performed on HHT patients who received maintenance intravenous bevacizumab and underwent at least one ENT ablation for epistaxis. Observation intervals were standardized to mirror each patient's bevacizumab treatment duration, ensuring equal pre- and within-treatment comparison windows. Ablation frequency (procedures/year) was compared before initiation and during bevacizumab therapy (including induction and maintenance) using the Wilcoxon signed-rank test.

Results:

Among 26 eligible patients with HHT, ablation frequency decreased significantly after bevacizumab initiation (median [IQR] 0.521 [0.214 – 1.014] vs. 0.00 [0.00 – 0.436] procedures/year, $p = 0.0013$). Across matched observation periods (mean follow-up 4.7 years, range 0.4 – 8.9 years), total ablations decreased by 55.6% (76 to 34). Ablation frequency decreased in 20 patients (76.9%), and 15 patients (57.7%) required no ablations after bevacizumab initiation.

Conclusion:

Maintenance systemic bevacizumab is associated with a significant reduction in epistaxis-related ablation frequency, with over half of patients requiring no further operative intervention. These findings suggest bevacizumab may reduce operative burden in HHT by decreasing the frequency and severity of epistaxis requiring surgical management.

Poster #A020

Biologic safety in type 2 inflammation: Machine learning analysis of FAERS

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Background:

Biologic therapies for type 2 inflammation are

increasingly used for overlapping indications including CRSwNP, yet comparative safety data remain limited. We trained a machine learning model to predict serious adverse events (SAE) and identify drug-specific risk factors from FAERS data.

Methods:

We analyzed 404,289 FAERS reports (2012–2024) across all indications for dupilumab ($n=313,021$), omalizumab (54,652), mepolizumab (33,554), and tezepelumab (3,062). SAEs were defined as death, hospitalization, disability, or life-threatening outcomes. Reporting odds ratios (ROR) quantified disproportionality and a temporally validated LightGBM (21 features) was benchmarked against logistic regression with SHapley Additive ExPlanations (SHAP) analysis.

Results:

LightGBM outperformed logistic regression (AUROC 0.837 vs 0.774; AUPRC 0.485 vs 0.281), robust to inverse probability weighting (0.830). Drug-specific signals included omalizumab—anaphylaxis (ROR=34.5), mepolizumab—eosinophilia (3.5) and herpes zoster (2.9), tezepelumab—arthralgia (2.2), while 13/17 reactions were reported at lower rates with dupilumab. Signals persisted after indication-overlap removal. Model discrimination generalized to CRSwNP ($n=21,684$; AUROC 0.779), where drug comparisons were robust to propensity and exact matching. Dupilumab had more injection site reactions (ROR=3.1) but fewer systemic events (fatigue 0.21; serious reactions 0.15; $p<0.0001$).

Conclusion:

In this first ML-based comparative safety analysis of type 2 biologics, drug-specific profiles were robust across confounding adjustments. Within CRSwNP, dupilumab had more local but fewer systemic adverse events than mepolizumab, supporting evidence-based biologic selection in sinonasal practice.

Poster #A021

WITHDRAWN

POSTERS

Poster #A022

Biphenotypic sinonasal sarcoma: A systematic review

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Background:

Biphenotypic sinonasal sarcoma (BSNS) is a rare low-grade spindle cell sarcoma defined by PAX3 fusions. Recognized in the 2017 WHO Classification, it remains poorly understood due to the rarity of cases. This systematic review synthesizes global evidence to characterize BSNS demographics, clinical features, histopathology, and treatment efficacy.

Methodology:

Following PRISMA 2020 guidelines, a comprehensive search of Medline, Embase, PubMed, and Cochrane Library was conducted from inception to October 2025. Inclusion criteria required histopathologically confirmed BSNS in adult patients with documented clinical management. From 3,924 identified records, 49 studies met eligibility for data extraction.

Results:

Data extraction is currently underway and includes demographics, tumour characteristics, molecular features, surgical approach, use of adjuvant therapy, recurrence patterns, and survival outcomes. Analysis included 174 patients (65% female, 35% male) with a mean age of 54.6 years. The nasal cavity and ethmoid sinus were the most common sites. Preliminary data indicates surgery is the primary treatment modality, though significant heterogeneity exists in surgical approaches and the use of adjuvant radiotherapy. Comprehensive pooled analysis regarding recurrence patterns and survival outcomes will be presented during the conference.

Conclusion:

This review is the most comprehensive synthesis of BSNS literature to date. By integrating clinical and pathological data, the findings clarify current management patterns and provide robust estimates for recurrence and survival. These results are intended to inform clinical decision-making and highlight critical knowledge gaps in this rare sinonasal malignancy.

Poster #A023

Bleomycin sclerotherapy for treatment of epistaxis in Hereditary Hemorrhagic Telangiectasia

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Background:

Hereditary Hemorrhagic Telangiectasia is a rare genetic disorder that often leads to arteriovenous malformations (AVMs), causing severe epistaxis. Currently available treatments provide only short-term relief. Bleomycin, a chemotherapeutic agent used for treatment of certain cancers, may play an important role in sclerosis of HHT AVMs.

Methods:

We present a case series of 9 HHT patients with moderate-severe epistaxis. Under general anesthesia, patients underwent endoscopy-assisted injection with 3U (1ml) of bleomycin diluted in saline, into submucosa underlying intranasal AVMs. Epistaxis severity scores (ESS) were compared 6 months pre-bleomycin vs 3 months and 6 months post-bleomycin sclerotherapy. Hemoglobin (Hgb), ferritin, number of blood transfusions, and ED visits before and after injection were recorded. Statistical analysis was done using a paired t-test.

Results:

A total of 3 males and 6 females with a median age of 69 years (IQR 51–77.5) were included in our analysis. One participant passed away before study endpoint due to laryngeal cancer. Our results show a decrease in mean ESS from 6.32 pre-op to 3.80 at 3 months (n=9; p-value<0.01) and 4.95 at 6-month post-op (n=8; p-value<0.05). Hgb levels increased from a mean pre-op level of 102.1 to a post-op level of 119.7 at 3 months (n=9; p-value<0.01), with minimal change to 106.4 at 6 months (n=8; p-value=0.32). Ferritin was unchanged before vs at 3 and 6 months after treatment. Six vs two participants had transfusions before vs at 6 months post-injection. Participants had a median ED visit of 2 (IQR 1.25) pre-op vs 0 at 6 months post-op.

Conclusions:

Bleomycin sclerotherapy may be effective in reducing epistaxis severity in HHT patients, for up to 6 months.

POSTERS

Poster #A024

BMI and BSA impacts on CRS

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Introduction:

Chronic rhinosinusitis (CRS) is a high-burden disease requiring multifaceted management. While comorbidities and treatments are well studied, the relationship between body habitus and CRS severity remains unclear. This study examines the association of body mass index (BMI) and body surface area (BSA) with patient-reported and objective disease burden in CRS.

Methods:

A retrospective cohort study of 730 adult CRS patients was identified at a tertiary rhinology clinic. Outcomes measured include the 22-item sinonasal outcome test (SNOT-22) and Lund-Kennedy (LK) endoscopic scores. BMI and BSA measurements on the same date or within a year of SNOT-22 scores were noted. Multivariable linear regression was performed to evaluate associations between BMI, BSA, and disease burden.

Results:

The cohort included 730 patients with a mean age of 58 ± 17 years. BMI was similar across groups (overall: 28.9 ± 6.7 kg/m²; $p=0.055$). CRS patients with nasal polyps (CRSwNP) demonstrated higher LK scores and were more likely to have prior surgery compared to CRS without nasal polyps (CRSSNP) (both $p<0.001$). SNOT-22 scores differed modestly between groups ($p=0.024$), with higher symptom burden in CRSSNP. BMI showed a positive association with SNOT-22 scores. BSA and male sex were associated with reductions in SNOT-22 scores. CRSwNP was associated with lower SNOT-22 scores compared to CRSSNP. Overall, effect sizes were small, limiting clinical significance.

Conclusion:

BMI and BSA demonstrate statistically significant but clinically modest associations with CRS symptom burden. These findings suggest that body habitus alone is unlikely to be a major driver of patient-reported or objective disease severity.

Poster #A025

Burden of allergic rhinitis in adults with Cystic Fibrosis and chronic rhinosinusitis

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Objective:

Quantify the prevalence of allergic rhinitis (AR) in adults with cystic fibrosis (CF), determine its co-prevalence in CF patients with chronic rhinosinusitis (CRS), and evaluate whether AR is associated with poorer sinonasal outcomes among CF patients with CRS.

Methods:

The TriNetX database was queried for patients ≥ 18 years through March 29, 2026. ICD-10 codes E84, J32, and J30 were used to identify patients with CF, CRS, and/or AR, respectively. Data were collected on demographics, prevalence, and risk ratios (RR) for adverse outcomes. Propensity score matching was performed based on age, sex, race, and ethnicity.

Results:

A total of 35,156 CF patients were identified and compared to patients without CF with similar baseline demographic characteristics. After propensity score matching, CF patients had a significantly higher prevalence of AR compared to non-CF patients (RR 1.3, 95% CI 1.26-1.37, $p<0.01$). Patients with CF+CRS were 18% more likely to have AR compared to non-CF+CRS patients (RR 1.2, 95% CI 1.13-1.24, $p<0.01$). Among CF+CRS patients, those with AR had greater rates of nasal polyposis than CF+CRS patients without AR (RR 1.4, $p<0.01$). CF+CRS patients with AR had increased risk of sinus surgery (RR 1.4, $p<0.01$), oral corticosteroid use (RR 1.2, $p<0.01$), and overall antibiotic use (RR 1.4, $p<0.01$) compared to CF+CRS patients without AR. These findings remained significant even after controlling for use of cystic fibrosis transmembrane conductance regulator modulator.

Conclusion:

Allergic rhinitis is more prevalent in adults with cystic fibrosis, particularly those with chronic rhinosinusitis, and may be associated with worse sinonasal outcomes.

POSTERS

Poster #A026

Categorical improvements in NC/LoS with Dupilumab in patients with CRSwNP: AROMA registry results

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Introduction

Dupilumab treatment leads to rapid improvements in key chronic rhinosinusitis with nasal polyps (CRSwNP) symptoms such as nasal congestion (NC) and loss of smell (LoS), but these are usually analyzed using mean population scores. As a 1-point reduction in these measures is considered a clinically meaningful within-patient change, this post hoc analysis of data from the AROMA registry (NCT04959448) investigated the impact of dupilumab on individual NC and LoS categories.

Methods:

AROMA is a phase 4, prospective, global registry study of adults with CRSwNP initiating dupilumab in real-world practice. In this post hoc analysis of AROMA data, short-term (28-day) and long-term (24-month) changes in NC and LoS severity categories (0 [none], 1 [mild], 2 [moderate], 3 [severe]) were analyzed.

Results:

600 patients who initiated dupilumab were included in this analysis. By Day 28, the proportions of patients with NC and LoS scores of 3 had decreased from 22.5% and 58.7% at baseline to 6.3% and 26.3%, respectively; further improvements were seen by Month 24 (additional decrease to 2.4% and 11.0%, respectively). Furthermore, the proportion of patients with NC and LoS scores of 0 increased over time (NC from 6.0% at baseline to 23.2% [Day 28] and 54.9% [Month 24]; LoS from 11.5% at baseline to 20.8% [Day 28] and 40.2% [Month 24]).

Conclusion:

In the real-world AROMA global registry, dupilumab led to rapid improvements in NC and LoS severity categories in the first 28 days, which were further improved up to 24 months.

Poster #A027

Chronic rhinosinusitis after Ocrelizumab therapy: Incidence, timing, and associated clinical factors

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Introduction:

Ocrelizumab, an anti-CD20 monoclonal antibody used in multiple sclerosis (MS), induces sustained B-cell depletion and may predispose patients to sinonasal disease. However, the incidence of chronic rhinosinusitis (CRS) and endoscopic sinus surgery (ESS) following ocrelizumab exposure and its associated risk factors remain uncharacterized.

Methods:

We conducted a retrospective cohort study across Mayo Clinic sites between 2018-2026 using the Mayo Clinic data retrieval tool. Conditions were classified using ICD-10-CM codes, and ocrelizumab-treated patients and ocrelizumab-unexposed MS controls were identified. Pre-existing CRS diagnoses were excluded from incidence analyses. Demographics, comorbidities, time to CRS, and ESS rates were analyzed using Fisher exact, Wilcoxon rank-sum, and multivariable logistic regressions.

Results:

Among 23,651 patients with MS (mean age 42.3±12.1 years; 67.2% female), we identified 1,773 ocrelizumab-treated and 21,878 ocrelizumab-unexposed controls. Incident CRS developed in 3.7% and 2.7% of patients, respectively (OR 1.42; p=0.014), with ESS rates of 11.5% vs. 8.4% (OR 1.41; p=0.132). On multivariable regression, drug exposure was not independently associated with CRS (OR 1.20; p=0.215). Median time to CRS was 28.5 months following ocrelizumab initiation, compared to 18.4 months in MS controls (p=0.161). Strongest independent predictors were allergic rhinitis, pre-existing immunodeficiency, tobacco use, and asthma (p<0.001).

POSTERS

Conclusion:

CRS affects a significant proportion of MS patients, driven predominantly by comorbidity burden rather than drug exposure independently. Findings highlight the importance of sinonasal monitoring in these high-risk patient cohorts.

Poster #A028

Chronic rhinosinusitis management in transplant patients

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Patients undergoing solid organ transplantation have been shown to be at higher risk of developing chronic rhinosinusitis (CRS). Management of pre-existing CRS prior to transplant has not been well described. We evaluated impact of pre-transplant medical management (MM) or endoscopic sinus surgery (ESS) on post-transplant outcomes.

Using the TriNetx research platform, we identified patients who underwent a kidney, liver, lung, heart, intestine, or pancreas transplant and had been diagnosed with CRS in the two years before transplant from 2006 to 2026. Patients were stratified by MM or ESS, propensity matching was performed. Outcomes were mortality, antibiotic use, and healthcare utilization. Demographics were compared with Pearson's chi-squared test or Wilcoxon rank sum test. Kaplan-Meier was used to analyze mortality and was compared with a log-rank test; antibiotic use was compared using risk difference (RD).

2003 MM and 107 ESS patients were identified. ESS patients were younger (43.8 ± 18.2 vs. 50.8 ± 17.1 , $p < 0.01$). ESS patients were less likely to have hypertension (53% vs. 65%, $p = 0.02$) or hyperlipidemia (28% vs. 42%, $p < 0.01$) but more likely to have COPD (32% vs. 23%, $p = 0.04$). After matching, 103 patients were compared. Mortality did not differ ($p = 0.92$), and management was not independently associated with mortality (HR 0.93, 95% CI 0.61, 1.42, $p = 0.74$). Number of ICU days (6.8 ± 8.5 vs. 8.4 ± 13.3 , $p = 0.54$) did not differ, MM patients had more emergency department visits (6.5 ± 7.6 vs. 3.6 ± 3.3 , $p < 0.01$)

Antibiotic use (RD 0, 95% CI -0.106, -0.106, $p = 1$) was not significantly different.

Pre-transplant management does not impact mortality or use of antibiotics, but surgical management may lead to lower emergency department utilization.

Poster #A029

Clinical characteristics, treatment, and survival in skull base metastases

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Introduction:

Skull base metastases present a clinical challenge due to complex anatomy and heterogeneous, often aggressive tumor biology. Outcomes in the modern era of multimodal therapy remain incompletely characterized. We evaluated clinical characteristics, treatment patterns, and survival in patients with skull base metastases.

Methods:

We performed a retrospective cohort study using the Mayo Clinic Data Explorer (2005–2025) to identify patients with metastatic cancer undergoing head or sinus imaging. Structured filters identified cases with suspected skull base involvement, followed by chart review to confirm. Overall survival (OS) was defined from diagnosis to death or last follow-up and estimated using Kaplan-Meier methods. A multivariable Cox model evaluated factors associated with survival.

Results:

A total of 132 patients were included. Median age was 65 years, and 55.3% were female. The most common primary tumors were breast (19.7%), lung (15.2%), prostate (10.6%), and renal (8.3%). Radiation was administered in 56.8% of cases, systemic therapy in 86.4%, and surgery in 4.5%, primarily for biopsy or limited debulking. Median OS was 26.7 months, with 6-, 12-, and 24-month OS of 77.5%, 69.0%, and 55.6%. On multivariable analysis, lung (HR 3.20, $p < 0.001$), melanoma (HR 8.91, $p < 0.001$), and renal primaries (HR 2.27,

POSTERS

p=0.022) were associated with worse survival, while solitary metastasis (HR 0.11, p<0.001) and systemic therapy (HR 0.43, p=0.010) were associated with improved survival.

Conclusions:

Skull base metastases are associated with moderate but variable survival. Tumor type, metastatic burden, and systemic therapy significantly influence outcomes, providing contemporary benchmarks for prognosis and management.

Poster #A030

Clinical course, management, and outcomes of sinonasal fibrous dysplasia

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Background/Objective:

Fibrous dysplasia (FD) is a rare condition characterized by a benign fibro-osseous overgrowth of normal bone with a distinct ground-glass appearance on computed tomography (CT) radiography. When severe, sinonasal FD may cause airway obstruction, hyposmia, and facial asymmetry. The objective of this study is to characterize the clinical course of sinonasal FD and evaluate its management and outcomes.

Study Design/Methods:

A retrospective review was performed at a tertiary academic medical center. All patients identified with FD affecting the sinonasal tract between January 2000 and August 2025 were included. Patient demographics, their clinical presentation, imaging follow-up, surgical intervention, and complications were investigated.

Results:

Thirty-two patients were identified (18 females and 14 males). The median age was 36 years (range 7-88). Twenty-two of the 32 (68.8%) were discovered incidentally. The most common presentation symptom was headache (n=5, 15.6%). Anatomically, 9 of the 32 patients (28.1%) had involvement of more than one sinonasal subunit, and the most commonly involved sinus was the maxillary (n=18, 56.2%) followed by the sphenoid (n= 14, 43.8%). Thirty were radiologically stable on interval imaging.

Five patients (15.6%) underwent surgical resection, with facial asymmetry being the most common surgical indication (2 of 5 subjects). There were no significant complications.

Conclusion:

Sinonasal FD is uncommon and often an incidental diagnosis and frequently follows an indolent course seldom requiring surgical intervention unless symptomatic.

Poster #A031

Clinically meaningful improvements in patient reported outcomes with Dupilumab vs placebo in AFRS

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Objective:

Post hoc analysis of LIBERTY-AIMS to assess the proportions of patients with allergic fungal rhinosinusitis (AFRS) achieving the minimal clinically important difference (MCID) in patient reported outcomes (PROs) when treated with dupilumab vs placebo.

Methods:

In LIBERTY-AIMS, a phase 3 placebo-controlled clinical trial (NCT04684524), patients ≥6 years of age with AFRS were randomized to dupilumab or matched placebo for 52 weeks. The proportion of patients meeting MCID in the 22-item sinonasal outcome test (SNOT-22) total score, defined as a difference of ≥8.9 from baseline, was assessed at Week 24 and Week 52. Response rate differences (RRD; 95% confidence interval [CI]), and nominal p-values are shown.

Results:

Overall, 62 patients were randomized (dupilumab, n=33; placebo, n=29). Mean (SD) baseline SNOT-22 scores were 44.2 (23.7) and 45.4 (20.4) for dupilumab and placebo, respectively. At Week 24, mean (SD) changes from baseline were -28.9 (24.6) and -8.7 (23.9)

POSTERS

for dupilumab and placebo, respectively. The proportions of patients meeting SNOT-22 MCID were 68.9% (dupilumab) and 47.3% (placebo), respectively, and the RRD (95% CI) for dupilumab vs placebo was 19.3% (−4.8, 43.5; $p=0.1166$). At Week 52, mean (SD) changes from baseline were −31.1 (23.8) and −11.3 (19.5) for dupilumab and placebo, respectively. The proportions of patients meeting SNOT-22 MCID were 75.5% (dupilumab) and 41.6% (placebo), and the RRD (95% CI) for dupilumab vs placebo was 34.5% (10.8, 58.1; $p=0.0043$).

Conclusion:

In this post hoc analysis of LIBERTY-AIMS, a higher proportion of patients with AFRS achieved the MCID for SNOT-22 total score with dupilumab than placebo at Weeks 24 and 52.

Poster #A032

CNN vs. GNN for automated nasal septal perforation detection on CT

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Purpose:

Nasal septal perforation (NSP) affects ~1% of the population yet remains underdetected on routine CT imaging. No prior study has directly compared deep learning architectures for automated CT-based NSP detection. We compared 3D convolutional neural network (CNN) and graph neural network (GNN) performance and evaluated clinical correlations with patient-reported outcomes.

Methods:

We retrospectively analyzed 257 sinus CT examinations (154 normal, 103 perforations; 2020-2023). Clinical variables included SNOT-22 scores and comorbidities. Both architectures underwent stratified 5-fold cross-validation and were tested on an independent holdout set ($n=52$). Performance was assessed by AUC.

Results:

The CNN significantly outperformed the GNN during cross-validation (mean AUC 0.891 ± 0.073 vs. 0.735 ± 0.060 ; $p=0.016$) and on the holdout

set (AUC 0.856 [95% CI $0.812-0.900$] vs. 0.590 [$0.531-0.649$]). At the optimal threshold, CNN sensitivity was 85.7% and specificity 83.9%. Perforation patients had higher SNOT-22 scores (48.3 ± 21.7 vs. 32.1 ± 18.9 ; $p<0.001$) and greater autoimmune disease prevalence (23.3% vs. 7.8%; $p<0.01$).

Conclusions:

A 3D CNN significantly outperformed a GNN for automated NSP detection on CT, achieving clinically meaningful diagnostic performance. These findings support CNN-based decision support in sinonasal workflows and underscore architecture selection as critical in rhinologic AI development.

Poster #A033

Combined endonasal and trans-orbital approach for resection of a medial apical orbital mass

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Introduction:

Tumors of the medial and apical orbit are challenging to approach due to difficult visualization and risk of injury to optic nerve due to excess anterior traction. This case report highlights a unique patient presentation featuring a combined endonasal and transorbital approach for resection of an extraconal medial orbital mass in the posterior 1/3 of the orbit.

Case:

67-year-old male with complaint of constant headache, horizontal binocular diplopia resolved with closing his left eye, and positional amaurosis on leftward gaze. Patient described left sided blurry vision and exacerbation of pain when looking to the left. MRI with 15 x 8 mm extraconal T2 enhancing mass along the left medial rectus with possible vascular extension seated in the posterior 1/3 of the orbit. A combined endonasal and orbital approach was performed which included a transconjunctival peritomy, endonasal medial orbital decompression, and excision of mass involving simultaneous transorbital and endonasal retraction/dissection. The final path was consistent with a capillary hemangioma.

POSTERS

Conclusion:

This case highlights the utility of combined endonasal and transorbital approach to large posterior medial orbital tumors. The transorbital approach alone provides insufficient tumor visualization and increases risk for optic neuropathy due to anterior traction. The endoscopic endonasal approach to these medial orbital tumors allows for improved visualization and identification using intraoperative navigation, easier mobilization of tumor, and gentler retraction leading to safer surgery.

Poster #A034

Comorbid type 2 disorders do not impact AERD severity and outcomes

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Introduction:

Aspirin-Exacerbated Respiratory Disease (AERD), associated with severe eosinophilic, type-2 (T2) inflammation, may also be associated with other comorbid T2 conditions. We investigated if the presence of these T2 comorbidities worsened AERD severity or outcomes.

Methods:

AERD patients identified with >6 months follow up by interrogating electronic health records. T2 comorbidities were recorded. Baseline disease severity markers were compared between +T2 and (-T2) groups.

Results:

240 AERD patients were identified with median follow-up of 60 months. Patients were divided into +T2: 86 (36.2%), -T2: 154 (63.8%) groups. Both groups had similar age, sex distribution, and anti-leukotriene use. The prevalence of comorbidities was as follows: allergic rhinitis (30%), eosinophilic esophagitis (2.9%), chronic urticaria (2.5%), eosinophilic otitis media (2.1%), allergic conjunctivitis (1.7%), eczema (1.7%), EGPA (1.3%), ABPA (0.8%), allergic dermatitis (0.4%), eosinophilic pneumonia (0.4%), eosinophilic bronchitis (0.4%).

AERD severity markers, including prior ESS rates, SNOT-22 scores, Lund-Mackay CT

scores, FEV1/FVC ratio, serum eosinophilia, ACT scores, uLTE4 levels and oral corticosteroid (OCS) use did not differ between +T2 and -T2 groups at both baseline and follow-up after intervention (surgery, biologic, desensitization).

Conclusions:

Comorbid eosinophilic disorders were present in about 36% of AERD patients but overall do not seem to impact AERD severity at presentation or response to any therapeutic intervention (surgery, biologic, desensitization). This may reflect a higher basal state of inflammation in AERD, where other T2 comorbidities do not appear to impact baseline severity or post-intervention prognosis.

Poster #A035

WITHDRAWN

Poster #A036

Comparing MRI scoring methods to characterize early sinonasal disease in pediatric Cystic Fibrosis

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Chronic rhinosinusitis (CRS) is a common manifestation of cystic fibrosis (CF), yet its presentation in young children with CF (YCwCF) is undercharacterized. Sinus magnetic resonance imaging (MRI) offers a non-invasive assessment of CRS severity without the use of ionizing radiation, but variability in scoring systems limit comparisons across studies. We investigated whether three MRI-based sinus scoring methods—the Lund-Mackay (LM) score, percent sinus opacification (%SO), and a CF-specific CRS-MRI score—capture similar CRS severity in a prospective cohort of YCwCF ages 2-8 years. Recruited from six US centers as part of a broader study, participants underwent coronal T2-weighted sinus MRI at baseline and 1-year follow-up. 39 MRI scans (20 baseline, 19 one-year follow-up) were graded using all three scoring systems,

POSTERS

each treated as a unique observation. We evaluated relationships among scoring approaches using correlation analyses, measures of internal consistency, and within-subject comparisons. Results showed strong correlations among all three scoring systems ($r = 0.82-0.90$), high internal consistency (Cronbach's $\alpha = 0.94$), and no significant differences in average severity across methods after accounting for scale differences, indicating strong agreement. These findings suggest that MRI scoring systems align in characterizing CRS, with implications for CRS quantification in pediatric CF populations. This also provides preliminary support for the validity of the %SO measure in MRI, extending prior validation in CT-based assessments. Establishing concordance across these methods is essential for evaluating longitudinal monitoring of disease progression in the era of highly effective CF therapies and comparison across studies.

Poster #A037

Comparison of postoperative pain in patients with and without OSA following ESS

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Background:

Comparing postoperative pain and analgesic use following endoscopic sinus surgery (ESS) between patients with obstructive sleep apnea (OSA) using positive airway pressure (PAP) therapy and patients without OSA.

Methods:

Adults with chronic rhinosinusitis (CRS) undergoing ESS were prospectively enrolled at four academic centers between 2019 and 2024. Patients with OSA receiving PAP therapy were compared with those without OSA. Postoperative pain was assessed using the Numeric Rating Scale (NRS) on postoperative days (POD) 1, 3, and 5. Analgesic use was evaluated by recording oxycodone and

acetaminophen tablet consumption through the first postoperative visit. Baseline characteristics and outcomes were compared using appropriate statistical tests. Multivariable linear regression analyses adjusted for potential confounders, including sex, diabetes mellitus, aspirin-exacerbated respiratory disease, and postoperative steroid use.

Results:

A total of 100 patients were included (51 non-OSA, 49 OSA using PAP). Median NRS pain scores were similar between groups at POD1 (3 vs 3, $p=0.66$), POD3 (1 vs 2, $p=0.52$), and POD5 (1 vs 1, $p=0.79$). In unadjusted analyses, opioid and acetaminophen use did not differ significantly. After adjustment, OSA status was not associated with pain scores at any time point. However, patients with OSA used significantly fewer oxycodone tablets ($\beta = -2.07$, 95% CI -4.07 to -0.06 , $p=0.043$). Acetaminophen use and dosing were similar between groups.

Conclusion:

Postoperative pain following ESS was comparable between patients with OSA on PAP therapy and those without OSA. These findings suggest that well-managed OSA is not associated with increased postoperative pain following ESS.

Poster #A038

Complications of reconstructive surgery in infants with congenital arrhinia

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Congenital arrhinia is a rare disease characterized by the absence of the olfactory system and related structures. There are fewer than 100 reported cases in the literature, making it challenging to understand potential treatment complications. Infants are born without external nares, leading to challenges with respiration and feeding. The goal of this literature review is to consolidate the complications of reconstructive treatment of congenital arrhinia. A systematic literature search was conducted in the PubMed/MEDLINE database to identify relevant studies. Because the literature on this topic is limited, a stepwise search refinement strategy was employed. An initial broad thematic search was conducted using keywords and MeSH terms related to arrhinia and nasal agenesis. This

POSTERS

search was subsequently refined to incorporate terms related to surgical management and acute complications. The most common complications associated with congenital arrhinia are respiratory distress and feeding difficulties. Neonates have historically been referred to as obligate nasal breathers, especially during the first six months of life. This pattern of respiration is required for feeding and is supported by normal embryogenesis. Unless there is respiratory distress, surgery is typically postponed to allow for sufficient development of the facial structures. Surgical complications in neonates include restenosis of the nasal cavity, collapse of the ala, and compromise of the skull base. Therefore, immediate surgical intervention is only required if there is significant respiratory compromise. Following surgery, patients have optimal respiration and restoration of confidence and aesthetic appearance.

Poster #A039

Computer vision techniques for automated eosinophil detection in CRSwNP: A scoping review

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This scoping review systematically examines the application of computer vision and machine learning techniques for automated eosinophil detection and quantification in histopathology of patients with Chronic Rhinosinusitis with Nasal Polyps (CRSwNP).

Eosinophil quantification plays a critical role in CRSwNP diagnosis and treatment selection, particularly for biologic therapies. However, manual counting is time-consuming, subject to inter-observer variability, and impractical for high-throughput clinical workflows. We systematically analyze methodological approaches, dataset characteristics, performance metrics, and clinical validation strategies across eight representative studies published between 2020 and 2025. The

findings reveal significant progress in achieving expert-level performance for eosinophil detection, with three distinct methodological paradigms identified: direct regression phenotyping using EfficientNet backbones, instance-based detection using transformers and hybrid architectures, and weakly supervised prognostic modeling. Performance metrics consistently exceed 0.90 correlation with expert pathologists, with Area Under the Curve (AUC) scores reaching 0.943 for prognostic prediction.

This review identifies key technical challenges, including generalizability across different staining protocols and geographic populations, and highlights promising directions for future research at the intersection of computer vision and precision medicine for CRSwNP.

Poster #A040

Computer vision telemetry for surgical workflow analysis during endoscopic sinus surgery

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Background:

Computer vision analysis of operative video is a promising tool for quantifying surgical workflow, though performance depends on annotation and training strategy. We extend our earlier endoscopic sinus surgery (ESS) detector with a revised annotation protocol, automated model selection, and an active field detector for time-resolved workflow analysis.

Methods:

Sixteen bilateral ESS procedures (43.4 hr total, 2.7 hr mean) were captured at 4K, 30/60 fps. Iterative sampling targeting prior-model confusions yielded 3,243 frames (70/15/15 train/val/test). Bounding boxes were anchored to the surgical glove's proximal edge rather than ambiguous instrument edges. Labels included ten instrument classes (e.g. suction) plus two auxiliary (empty hand, uncertain). A separate detector trained on 124 frames localized the patient's nose and flagged an

POSTERS

instrument as in-use when its bounding box came within 5% of frame width of the nose box. An automated sweep (34 runs) screened YOLOv8–26 (s/m/l/x), ran a hyperparameter grid on the top three, and selected YOLO26s.

Results:

During training, the auxiliary classes consistently improved mAP and were retained in the 12-class final model. Disabling scale augmentation and setting image size to 1024 pixels improved mAP, reflecting instruments' consistent in-frame size. On the test set the model achieved precision 91.1%, recall 83.5%, mAP50 88.5%. Applied to full-length videos, the model quantified instrument utilization (e.g. suction $9.49\% \pm 2.88\%$) and swap frequency (434.3 ± 132.4 swaps per procedure).

Conclusion:

A glove-edge annotation protocol and automated architecture sweep yield a scalable ESS instrument detector; an active field detector enables utilization and swap-frequency analysis.

Poster #A041

Cost analysis of in-office vs OR sinus surgery for CRS in Canada's publicly funded healthcare system

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Background:

In-office sinus surgery (SS) under local anesthesia for chronic rhinosinusitis (CRS) is an effective alternative to operating room (OR) SS. Improved access may reduce healthcare costs by expediting operative scheduling. However, adoption remains limited due to inadequate funding. This study compared direct and societal costs of in-office versus OR sinus surgery, including the financial impact of surgical wait times in a public system.

Methods:

A time-driven activity-based costing model estimated direct procedural costs for in-office SS, including physician fees, nursing time, disposable equipment, and equipment amortization based on procedure duration and case volume. OR SS costs were derived from

published literature and institutional data.

Annual out-of-pocket expenses and productivity losses were obtained from Canadian studies and applied to our wait times of 12 months (in-office) and 18 months (OR). All costs were adjusted to 2026 CAD.

Results:

Procedural costs for in-office SS were \$1,057, consisting of consumables (\$472), physician fees (\$274), nursing costs (\$69), and equipment amortization (\$242). OR SS procedural costs were estimated to be \$4,805. Annual out-of-pocket expenses for CRS patients and productivity losses due to CRS disease burden were \$853 and \$16,464. Total costs, including wait time burden, were \$18,374 and \$30,781 for in-office SS and OR SS, respectively, representing a difference of \$12,407 per patient.

Conclusion:

In-office SS demonstrates substantially lower procedural and societal costs through reduced wait times and less associated productivity losses. Expanding access to in-office SS may significantly reduce the overall economic burden of CRS in Canada.

Poster #A042

Cost-effectiveness of hemostatic agents in prevention of postoperative epistaxis

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Introduction:

Post-operative epistaxis is a potential complication of endoscopic sinus and anterior skull base surgery, and in some circumstances necessitates operative intervention. Many agents are often used to prevent this complication but their cost-effectiveness is unclear.

Methods:

We identified patients at our institution who underwent endoscopic sinus or skull base

POSTERS

surgery and who had postoperative epistaxis requiring return to the operating room from May 2010 to June 2025. Clinical data was collected, as were costs associated with this additional procedure and associated readmission. Costs of topical and inhaled agents used to prevent epistaxis were calculated.

Results:

We identified 40 adult patients who required a return to the operating room, most of whom did not have a hematologic disorder (n=37) nor were on anticoagulants (n=37). The average total cost of the return to operating room episode was \$20,175 although with wide range, from \$4,650 up to \$133,000. The largest driver of cost was length of stay, with patients readmitted for over 5 days averaging ~\$40,000 more in costs than those staying only one day. Agents utilized to prevent epistaxis were low cost, ranging \$6 per unit of Surgifoam to \$144 for Floseal. TXA was also relatively inexpensive— \$19 per intranasal use and \$4 for oral tablet. Our calculated return to operating room rate over this time period was 0.79% for endoscopic sinus surgery and 0.28% for transsphenoidal approaches.

Conclusion:

The cost of postoperative epistaxis requiring operative intervention is substantial compared to the cost of hemostatic agents. All products up to a cost of \$200 are cost-effective, as long as they drop the rate of epistaxis requiring return to OR by at least 1%.

Poster #A043

CRS impacts quality of life independent of comorbid mental health in the AoU database

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Introduction:

Chronic rhinosinusitis (CRS) has well-described associations with comorbid mental health conditions and reduced quality of life. Here we use the All of Us database (AoU) to investigate how CRS influences mental and physical health, independent of anxiety and depression.

Methods:

Retrospective cohort study of patients in AoU who completed the Overall Health Survey

(OHS), measuring reported physical and mental health, and social satisfaction. CRS was defined by 2+ documented diagnoses, including one within 12 weeks of completing the OHS. Multivariate logistic regression was performed to evaluate the association between quality of life and CRS, adjusting for factors including sex, race, ethnicity, Charlson comorbidity index, smoking, alcohol use, education, income, insurance, and prior depressive and anxiety diagnoses.

Results:

Applying the above conditions resulted in a cohort of 1,851 CRS cases and 535,544 controls. Patients with CRS were older, commonly female, and had higher rates of pre-existing depressive and anxiety diagnoses (p<0.001). After adjustment, CRS patients reported worse physical health (OR 1.27, p<0.001), reduced daily physical activities, e.g. walking, climbing stairs, or carrying groceries, (OR 1.30, p<0.001), and decreased social satisfaction (OR 1.24, p=0.003). CRS patients were more likely to report 7-day emotional problems (OR 1.14, p=0.018), but with no difference in reported overall mental health (OR 0.99, p=0.089).

Conclusion:

In a diverse national sample, CRS is significantly associated with worse reported physical health and social satisfaction even after controlling for comorbid anxiety/depression, suggesting a specific decrease in quality of life independent of mental health burden.

Poster #A044

CRSwNP prevalence and incidence in adults and adolescents from 2016–2024

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Background:

Contemporary US population-based estimates of chronic rhinosinusitis with nasal polyps (CRSwNP) prevalence and incidence, especially in adolescents, are limited.

POSTERS

Methods:

We conducted a retrospective observational study using Optum Clinformatics DataMart, including adolescents (12–17 years) and adults (18–84 years) in years of medical and pharmacy enrollment (2016–2024). Annual prevalence was ≥ 1 CRSwNP diagnosis (ICD-10 J33.x) in the year. Annual incidence was ≥ 1 CRSwNP diagnosis in the year with no prior CRSwNP diagnosis. Estimates were calculated overall, by sex, and by age group and standardized to the US population. A sensitivity analysis required ICD-10 J33.0 or J33.9 with ≥ 1 diagnosis from an allergist or otolaryngologist or ≥ 2 diagnoses from other providers.

Results:

The study included 109,891,713 individuals across study years (11-13.2 million annually; 5% aged 12–17). In adults, the US-standardized prevalence of CRSwNP per 100,000 people was 178.9, 179.2, 181.2, 185.4, 161.1, 183.3, 204.8, 219.3, 216.6 from 2016 to 2024; incidence was 118.8, 116.9, 116.2, 116.4, 94.1, 110.0, 121.9, 132.0, 125.3 from 2016 to 2024. Prevalence and incidence generally increased over time, with a dip during the COVID-19 period. Estimates were lower in adolescents (prevalence: 56.1 and 64.4; incidence: 42.9 and 47.3 in 2016 and 2024, respectively). Estimates were higher in males than females and highest in older adults. In sensitivity analysis, adult prevalence was 110.3 in 2016 and 137.6 in 2024; incidence was 72.7 in 2016 and 79.0 in 2024.

Conclusion:

Incidence and prevalence of CRSwNP in the US increased in recent years. These results provide contemporary benchmarks for diagnosed, medically-attended CRSwNP burden in the US.

Poster #A045

CT-NAO: An automated CT score for nasal airway obstruction

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Background:

Preoperative evaluation of nasal airway obstruction (NAO) relies on history, nasal endoscopy, and patient-reported outcomes. While computed tomography (CT) provides structural insight, no automated framework exists to summarize anatomical features into a standardized composite assessment. We developed the CT-NAO Score to assess the feasibility of automated CT-based morphometric analysis for NAO.

Methods:

One hundred thirty CT scans from a public dataset (NasalSeg) were analyzed using an automated pipeline. Five domains were extracted: nasal airway tissue burden, middle turbinate anatomy, nasal valve geometry, posterior-to-anterior airway caliber, and asymmetry. Domains were scored using cohort-derived percentile thresholds and summed to generate a composite score (0-15). Cross-sectional area profiles were grouped using an unsupervised approach to identify airway patterns. Comparisons used t-tests and ANOVA.

Results:

Composite scores ranged from 1-11 (mean 4.9, SD 2.2; median 4). Concha bullosa was present in 18.5% and associated with higher scores (7.3 vs 4.3, $p < 0.001$). Domain contributions were balanced. Three airway patterns were recognized, including a posterior-narrowing phenotype associated with higher scores (6.1 vs 4.3-4.7, $p = 0.001$). Scores showed a weak but significant correlation with geometry-derived airflow resistance ($r = 0.208$, $p = 0.018$), suggesting the score captures structural features not reflected by resistance models.

Conclusion:

NAO is difficult to quantify. This study demonstrates feasibility of an automated, multi-domain CT framework for structural assessment. The CT-NAO Score is hypothesis-generating and unvalidated. Future work will incorporate detailed labeling and patient-reported outcomes.

POSTERS

Poster #A046

Cystic Fibrosis mutation classes predict sinonasal and olfactory specific quality of life

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Background:

Chronic rhinosinusitis (CRS) and olfactory dysfunction (OD) are common in people with cystic fibrosis (PwCF). In many organ systems, the association between CF genotype severity and clinical manifestations is well studied; disease severity is associated weakly (pulmonary) or strongly (pancreas and reproductive) with mutation class severity. However, the impact of CF mutation classes on CRS or OD severity is poorly studied.

Methods:

Single-center cross-sectional study of PwCF. The 22-item Sinonasal Outcome Test (SNOT-22, sinonasal quality of life [QOL]), Questionnaire of Olfactory Disorders – Negative Statements (QOD-NS, olfactory-specific QOL), and Sniffin Sticks Comprehensive Smell Testing were administered. Mutation classes and genotype severity were determined via the CFTR2 online database.

Results:

40 PwCF were enrolled. With a traditional severe (two copies of class I to III mutations) vs mild (at least one class IV to VI mutation) genotype analysis, there were no significant differences in SNOT-22, QOD-NS, or Sniffin Sticks.

When comparing PwCF with vs without at least one class I mutation, there was a significant difference in QOD-NS ($p=0.04$). When comparing PwCF with vs without at least one class I or II mutation, there were significant differences for SNOT-22 rhinologic ($p=0.02$) and extra-nasal rhinologic ($p=0.046$) sub-scores.

Conclusion:

CF mutation classes may predict sinonasal and

olfactory specific QOL but must be evaluated in a sinonasal-specific manner. Results suggest that a more severe genotype is required to manifest severe sinonasal disease. Further work is needed to understand how the various CF genotypes contribute to differential degrees of CRS and OD.

Poster #A047

Deep learning-driven identification of onodi cells on sinus CT

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Background:

Onodi cells are posterior ethmoid air cells that extend superiorly and laterally to the sphenoid sinus and may abut or envelop the optic nerve and internal carotid artery. Failure of recognition can result in complications during endoscopic sinus and skull base surgery, including vision loss and carotid artery injury. However, Onodi cells are inconsistently identified in routine workflows, partly due to reliance on manual CT review. This study aimed to develop an automated, segmentation-based framework to identify Onodi cells on sinus CT imaging.

Methods:

A retrospective dataset of 78 sinus CT scans with manual regional segmentations was used for model development. A 2.5D multi-plane deep learning model generated segmentations with Dice coefficients >0.90 for the frontoethmoid and sphenoid sinuses. Side-specific features capturing posterior, superior, and lateral relationships between regions were used to train a classifier to predict Onodi presence. Performance was evaluated using repeated grouped five-fold cross-validation.

Results:

Onodi cells were present in 19% of the dataset. Discrimination performance was strong, with a mean AUROC of 0.88 and AUPRC of 0.65 across repeated grouped cross-validation. Mean

POSTERS

accuracy was 84%, with consistent performance across splits despite variation in Onodi cell prevalence. AUPRC exceeded three times the underlying class prevalence, supporting meaningful precision-recall performance in this imbalanced setting.

Conclusion:

A segmentation-driven framework can identify Onodi cells with strong discrimination using routine CT imaging. This approach enables automated extraction of skull base variants and may support integration into reporting and preoperative risk stratification.

Poster #A048

Delays in care and chronic rhinosinusitis disease severity

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The impact of symptom duration on measures of CRS is poorly understood, as is the influence of social support, neighborhood cohesion, and community disadvantage on symptom duration.

We conducted a single-institution retrospective cohort study of medically refractory CRS patients who underwent sinus surgery and completed prospective assessments of social support and neighborhood cohesion. Patients were stratified into three symptom duration cohorts: <1 year, 1–3 years, and >3 years. Disease burden was assessed using SNOT-22 scores while disease severity was measured using Lund–Mackay (LM) and Lund–Kennedy (LK) scores. Clinically significant improvement is a change of SNOT-22 ≥ 8.9 points and LK ≥ 1.2 points. Group differences were tested with chi-square and ANOVA while associations with symptom duration were analyzed using odds ratios. We included 92 patients (mean age: 52; 45% female; 74% White; 18% Black; 42% Hispanic). Symptom duration cohorts did not differ by age, sex, race, social support, neighborhood safety or cohesion, or community disadvantage.

Longer symptom duration was associated with higher preop LK scores (OR 7.32, 95% CI 1.79–30.00) and trended toward higher SNOT-22

(OR 1.77, 95% CI 0.52–6.07) and LM scores (OR 1.18, 95% CI 0.37–3.78). Longer symptom duration was associated with a trend toward lower odds of a clinically significant change in 3-month postop SNOT-22 (OR 0.46, 95% CI 0.11–1.96) and LK scores (OR 0.28, 95% CI 0.05–1.41); this relationship persisted up to one year after surgery. Longer symptom duration in CRS links to higher disease severity and trends of worse patient-reported burden and postoperative improvement. These findings emphasize the need for timely care to reduce disease burden and severity.

Poster #A049

Demographic disparities in diagnosis and treatment of anxiety and depressive disorders in CRS

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Objective:

The associations between chronic rhinosinusitis (CRS) and mental health disorders (MHDs) are well-characterized, but the impact of demographic factors on diagnosis and treatment remains poorly understood.

Study Design:

Retrospective cohort study

Methods:

Adults diagnosed with CRS in the past 20 years without prior anxiety or depressive disorders were included. The primary outcome was new anxiety or depression diagnoses within 2 years of CRS diagnosis. The secondary outcome was treatment with pharmacotherapy among those with new MHD diagnosis. Analyses were stratified by sex, CRS phenotype (with or without nasal polyps), race, ethnicity, and primary language. Propensity matching adjusted for demographic and clinical covariates, including CRS treatment with intranasal steroids, immunotherapy, and endoscopic sinus surgery. Odds ratios (OR) with 95% confidence intervals (CIs) were calculated to evaluate associations with diagnosis and treatment.

Results:

Among 2.1 million individuals, female sex

POSTERS

(OR:1.74, 95%CI:1.72–1.76), CRS with nasal polyps (OR:1.41, 95%CI:1.36–1.46), and White race (OR:1.40, 95%CI:1.37–1.42) were associated with higher odds of new anxiety or depression. White patients had particularly higher odds than Asians (OR:1.86, 95%CI:1.77–1.95). Among 202,188 newly diagnosed with MHDs, 13.50% received pharmacotherapy. White patients were more likely to receive pharmacotherapy than other minorities (OR:1.36, 95%CI:1.29–1.43), with the largest disparity observed among Native Hawaiian/Pacific Islanders (OR:3.36, 95%CI:2.44–4.63).

Conclusions:

Demographic and clinical factors significantly influence diagnosis and treatment of MHDs among patients with CRS.

Poster #A050

Diagnostic characteristics of preoperative imaging for dural involvement in sinonasal and ventral skull base malignancies

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Background:

Surgical resection of sinonasal and ventral skull base malignancies requires balancing neurovascular preservation with oncologic margins. Dural involvement is associated with worse survival and higher recurrence. Understanding the characterization of dural involvement on preoperative imaging may improve operative planning.

Objective:

To assess the diagnostic test characteristics of preoperative MRI and CT compared with histopathology in identifying dural involvement in sinonasal and ventral skull base malignancies with dural resections.

Methods:

A single-institution retrospective cohort study of

adult patients with a diagnosis of sinonasal or ventral skull base malignancy treated surgically with dural resection (endoscopic or combined open/endoscopic) between 2010-2025. Preoperative imaging and pathology were reviewed.

Results:

Sixty-six patients were included. Preoperative imaging showed skull base encroachment in 16.7%, skull base erosion in 13.6%, and dural involvement in 69.7% of cases. Imaging sensitivity and specificity for dural involvement were 86.8% and 100%, with a PPV of 100%, and an NPV of 65%. The false negative rate for radiographic dural involvement was 13.2%. Among patients with skull base encroachment or bone erosion, the occult dural involvement rates were 28.6% and 71.4%, respectively.

Conclusions:

When radiographically present, MRI and CT reliably identify pathologic dural involvement and can guide when to incorporate dural resection during treatment. Negative imaging is insufficient to exclude dural involvement in tumors nearing the skull base. In cases with skull base encroachment and bone erosion, occult dural involvement should be considered when planning extent of resection.

Poster #A051

WITHDRAWN

Poster #A052

WITHDRAWN

Poster #A053

Diversity in otolaryngology device clinical trials

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Introduction:

The FDA Safety and Innovation Act of 2012 (FDA-SIA) was enacted to improve demographic data and inclusivity in clinical trials. It is crucial that the clinical trials which inform the field of Otolaryngology include representative data for ensuring the safety and

POSTERS

efficacy of medical devices to all patients. This study evaluates the impact of the FDA-SIA on demographic reporting and representation within otolaryngology Premarket Approval (PMA) medical device trials.

Methods:

Nineteen original FDA-approved ENT device trials that were identified via the FDA Premarket Approval (PMA) database and stratified as pre-SIA (n=10) and post-SIA (n=9). Reporting frequencies and enrollment demographics including age, sex, race, and ethnicity were obtained and compared to the 2010 US Census. Chi square testing was performed for analysis and to assess generalizability.

Results:

Reporting of age increased from 80% pre-SIA to 100% post-SIA. Race and ethnicity reporting each tripled (10% to 33.33%) following the SIA. Post-SIA, Black (7.94%) and Hispanic (7.85%) representation improved. However, of the studies reporting these variables, none had statistically similar representation compared to the US Census and no subgroup analyses for race or ethnicity were performed. Physical metrics including height, weight, and BMI were not reported by device trials.

Conclusion:

Following the 2012 FDA-SIA, there was a modest increase in demographic reporting in ENT device trials and a trend toward including a more representative sample of patients. However, there is still substantial room for improvement and thus a need for stricter mandates to ensure both safety and efficacy of these devices for our patients.

Poster #A054

Does frontal sinus disease severity influence postoperative quality of life in CRSwNP?

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Introduction:

Chronic rhinosinusitis with nasal polyps (CRSwNP) is a chronic inflammatory condition associated with significant impairment in quality of life (QoL). Endoscopic sinus surgery (ESS) is indicated for patients with persistent symptoms despite maximal medical therapy. Frontal sinus surgery is considered technically challenging due to anatomical variability of the frontal

recess, and the extent of frontal sinus involvement may influence postoperative outcomes. This study aims to compare QoL and endoscopic outcomes after ESS according to the degree of frontal sinus involvement in patients with CRSwNP.

Material and Methods:

In this cross-sectional study 57 adult patients with medically refractory CRSwNP scheduled for ESS were enrolled. QoL and endoscopic outcomes were evaluated using the Sino-Nasal Outcome Test-22 (SNOT-22) and Lund–Kennedy endoscopic scores.

Results:

Preoperative Lund–Mackay and Lund–Kennedy scores were significantly higher in the complete involvement group ($p<0.001$ and $p=0.003$, respectively). Baseline SNOT-22 scores did not differ significantly among groups ($p=0.110$). All groups demonstrated marked postoperative improvement in SNOT-22 scores; however, no statistically significant differences were observed between groups at any postoperative time point (2 weeks $p=0.888$, 1 month $p=0.251$, 6 months $p=0.050$). Postoperative Lund–Kennedy scores were numerically higher in patients with complete frontal sinus involvement, although this difference was not statistically significant ($p=0.149$).

Conclusion:

Although frontal sinus involvement is associated with greater radiologic and endoscopic disease severity, it does not appear to adversely affect postoperative QoL outcomes following ESS in patients with CRSwNP

Poster #A055

Does smell test choice matter in CF patients?

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Introduction:

Olfactory dysfunction impacts many patients with Cystic Fibrosis (CF), yet we lack objective assessment in this population. This study examines two validated olfactory tests and patient-reported outcomes in a prospective CF cohort.

Methods:

Adults with CF were enrolled in a prospective longitudinal observational cohort at a single

POSTERS

academic center. All subjects completed UPSIT or Sniffin' Sticks (TDI) and same-visit QOD-NS and SNOT-22 questionnaires. Scores were averaged across visits and categorized per each tool's interpretation guide. Statistical analysis was performed using SPSS.

Results:

Twelve participants were included (8F/4M). Mean UPSIT was 32.37 (5 normosmia, 4 mild, 3 moderate microsomia); mean TDI was 29.34 (5 normosmia, 7 microsomia). Categorical agreement occurred in 6/12 cases. UPSIT correlated significantly with SNOT-22 item 5 ($p=-0.57$, $p=0.05$); TDI did not ($p=-0.33$, $p=0.30$). Neither test correlated significantly with QOD-NS (UPSIT: $p=0.06$, $p=0.86$; TDI: $p=-0.37$, $p=0.24$). Kruskal-Wallis analyses showed no significant differences in subjective olfactory scores across objective test categories for either instrument.

Conclusion:

Our cohort data suggests no difference in UPSIT vs TDI performance for patient-reported smell outcomes measured by QOD-NS. TDI classified more participants as microsmic than UPSIT, potentially reflecting its composite threshold-discrimination-identification paradigm detecting subclinical deficits missed by identification-only testing. The absence of QOD-NS correlation with either objective test may reflect its lack of validation in CF populations rather than true absence of olfactory burden. A floor effect on SNOT-22 item 5, with most participants scoring 0, further limits subjective outcome.

Poster #A056

Draf-III with steroid-eluting stents: Symptomatic and endoscopic outcomes in chronic rhinosinusitis

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Introduction:

Steroid-eluting stenting (SES) at the end of endoscopic sinus surgery (ESS) is used to try to reduce stenosis and improve outcomes in the surgical management of chronic rhinosinusitis (CRS). We aimed to clarify these benefits in those undergoing Draf-III frontal

sinusotomy and based on the presence (CRSwNP) or absence (CRSSNP) of polyps.

Methods:

A single-center retrospective cohort study was conducted on patients with CRS who underwent Draf-III with SES without free mucosal graft between 2018 and 2024. Data at baseline and first 3 postoperative visits were collected, including Sinonasal Outcome Test (SNOT-22) scores, modified Lund-Kennedy (mLK) scores, and frontal sinus stenosis evidence; defined as >50% decrease in opening size.

Results:

The cohort included 13 patients (CRSwNP n=7; CRSSNP n=6). The combined data and CRSSNP subgroup had statistically significant mean differences (MDs) from baseline at all postoperative visits (14.1, 16.2, and 10.6 for combined, 14.7, 14.3, and 13.5 for CRSSNP). The CRSwNP subgroup had significant improvements at the first 2 postoperative visits, but not the third (MDs of 13.6, 17.8, and 8.1). Resolution of primary pre-Draf-III symptom was 69%. Postoperative mLK scores did not vary over time and were significantly higher in the CRSwNP subgroup. The incidence of frontal sinus stenosis was 7.7%.

Conclusion:

In those with CRS who underwent Draf-III with SES without free mucosal graft, there was a low stenosis rate and significant improvement in SNOT-22 outcomes, with a recurrence of symptoms in the CRSwNP subgroup at last follow-up. The majority of patients experienced resolution of primary preoperative symptom. These findings point to the efficacy of SES in this study population.

Poster #A057

Dupilumab and revision ESS trends in CRSwNP

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POSTERS

Background:

Chronic rhinosinusitis (CRS), including CRS with nasal polyps (CRSwNP), is commonly managed with endoscopic sinus surgery (ESS), with some patients undergoing revision procedures. Dupilumab was FDA-approved in 2019 for CRSwNP, but its impact on revision ESS rates remains unclear. We evaluated temporal trends in revision ESS following dupilumab introduction.

Methods:

A retrospective cohort study was performed using TriNetX. Patients were stratified into CRS, CRSwNP, and CRS without nasal polyps (CRSsNP). Patients with non-CRS diagnoses were excluded. Revision ESS was identified using CPT codes following index ESS. Annual proportions of revision ESS among CRSwNP patients were calculated and analyzed using linear regression to assess trends after dupilumab FDA approval.

Results:

The total CRS cohort included 164,269 patients, of whom 23,359 (14.22%) underwent revision ESS within five years. Revision rates were higher among CRSwNP patients (31.18%) compared to CRSsNP patients (9.22%). Among CRSwNP patients, annual revision ESS rates declined consistently from 29.7% in 2019 to 16.1% in 2025, representing a 45.6% relative decrease over six years. Linear regression confirmed a significant annual decline following dupilumab approval (annual percent change [APC]: -2.07% per year, $R^2=0.995$, $p=0.0002$). Among CRSsNP patients, revision rates similarly declined from 11.3% in 2019 to 7.5% in 2025 (APC: -0.62% per year, $R^2=0.891$, $p=0.0013$), though the magnitude of decline was substantially smaller.

Conclusion:

Revision ESS rates in CRSwNP have declined since 2019. These findings suggest that changes in disease management may impact return-to-OR rates, highlighting a meaningful reduction at the population level.

Poster #A058

Dupilumab effectiveness through 24 months in patients from the United States with CRSwNP in AROMA

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Scott Nash, Dr.

Introduction:

We report the long-term effectiveness of dupilumab in patients from the United States (US) with chronic rhinosinusitis with nasal polyps (CRSwNP) enrolled in the global AROMA registry.

Methods:

AROMA (NCT04959448) enrolled adults with CRSwNP initiating dupilumab in real-world clinical practice, monitoring them for up to 36 months (M). The current analysis reports data up to M24, with a cut-off of June 2024.

Results:

AROMA enrolled a total of 691 patients, with 370 patients enrolled within the US. Of patients from the US, mean (SD) age was 48.6 (14.0) years, 46.5% were male, 70.5% were white, 63.5% had any prior sinonasal surgery, and 65.1% had OCS/SCS use in the 24 months prior to enrollment. Nasal congestion scores (range 0–3) decreased from mean (SD) 1.6 (SD 0.9; $n=325$) at baseline, to 0.9 (0.8; $n=280$) at M3, 0.8 (0.8; $n=172$) at M12, 0.8 (0.7; $n=96$) at M18, and 0.7 (0.7; $n=44$) at M24. Loss of smell scores (range 0–3) decreased from mean (SD) 1.9 (1.2; $n=325$) at baseline, to 1.0 (1.1; $n=280$) at M3, 0.9 (1.1; $n=172$) at M12, 0.9 (1.1; $n=96$) at M18, and 1.1 (1.0; $n=44$) at M24. 22-item sino-nasal outcome test scores (range 0–110) changed from mean (SD) 41.8 (21.2; $n=288$) at baseline, to 21.1 (15.5; $n=218$) at M3, 17.0 (15.7; $n=107$) at M12, 17.4 (16.3; $n=40$) at M18, and 22.2 (15.7; $n=19$) at M24. Patients reporting “no symptoms” on the global patient assessment were 4.6% ($n=13$) at baseline, 29.1% ($n=66$) at M6, 33.1% ($n=45$) at M12, 33.3% ($n=18$) at M18, and 30.4% ($n=7$) at M24.

Conclusion:

For patients in the US in the global AROMA registry, dupilumab initiation improved disease severity as early as month 3, with effects maintained up to 24 months’ follow-up, as assessed by patient-reported outcomes.

POSTERS

Poster #A059

Dupilumab efficacy by prior surgery in patients with CRSwNP and asthma: EVEREST study results

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Introduction:

In EVEREST, dupilumab demonstrated rapid and sustained improvements over omalizumab in airway outcomes in patients with severe chronic rhinosinusitis with nasal polyps (CRSwNP) with coexisting asthma. This post hoc analysis compared patient outcomes stratified by sinonasal surgery history (0/1/≥2).

Methods:

EVEREST (NCT04998604) randomized adults with severe CRSwNP and coexisting asthma to dupilumab 300 mg every 2 weeks or omalizumab 75–600 mg every 2 weeks or 4 weeks for 24 weeks on background mometasone furoate nasal spray. For sinonasal surgery history subgroups, endpoints were Week (W) 24 changes from baseline in nasal polyp score (NPS, 0–8), University of Pennsylvania Smell Identification Test (UPSIT, 0–40) and loss of smell score (LoS, 0–3).

Results:

360 randomized patients (dupilumab, n=181; omalizumab, n=179) were stratified in 3 sinonasal surgery history subgroups (0/1/≥2). Adjusted mean treatment differences (95% CI) at W24 for dupilumab vs omalizumab were –1.69 (–2.52, –0.87), –1.67 (–2.28, –1.06), –1.51 (–2.03, –0.99) for NPS with 0 (n=63), 1 (n=113), and ≥2 (n=161) prior surgeries, respectively. For UPSIT, differences at W24 were 7.26 (3.29, 11.23), 8.30 (5.35, 11.26), 8.11 (5.61, 10.61) for 0 (n=63), 1 (n=114), and ≥2 (n=162) prior surgeries. For LoS, differences at W24 were –0.82 (–1.29, –0.36), –0.68 (–1.02, –0.33), –0.90 (–1.19, –0.61) for 0 (n=63), 1 (n=113), and ≥2 (n=160) prior surgeries.

Conclusion:

Dupilumab improved CRSwNP outcomes more

than omalizumab in patients with severe CRSwNP and coexisting asthma, regardless of prior surgery history. Dupilumab may be effective as an early intervention in patients naive to surgery or with prior surgeries in a comorbid CRSwNP and asthma population.

Poster #A060

Dupilumab improves SNOT-5 responses versus Omalizumab in patients with CRSwNP: EVEREST study results

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Introduction:

In chronic rhinosinusitis with nasal polyps (CRSwNP), the 22-item Sino-Nasal Outcome Test (SNOT-22) is an established clinical outcome. SNOT-5 is a concise, rhinology focused subset of SNOT-22 designed to simplify the evaluation of CRSwNP symptoms. This post hoc analysis of data from EVEREST investigated the impact of dupilumab and omalizumab on SNOT-5 scores.

Methods:

EVEREST (NCT04998604) randomized adults with severe CRSwNP and coexisting asthma to dupilumab 300 mg every 2 weeks or omalizumab 75–600 mg every 2 or 4 weeks for 24 weeks with background mometasone furoate. We report the changes from baseline in SNOT-5 score (0–25) (least-squares mean (LSM) difference (SE; 95% CI); nominal p-value) at Weeks (W) 4 and 24 and Spearman correlation between SNOT-5/22 scores and nasal polyp score (NPS) at W24 (higher value indicating stronger correlation).

Results:

The analysis included 360 patients (dupilumab, n=181; omalizumab, n=179). Mean (SD) SNOT-5 scores at baseline were similar in dupilumab and omalizumab groups: 19.4 (3.7) and 19.8 (3.7), respectively. By W4, the LSM difference (SE; 95% CI) in SNOT-5 for dupilumab vs omalizumab was –3.42 (0.49; –4.39, –2.45; P<0.0001). At W24 the LSM difference (SE; 95% CI) in SNOT-5 for dupilumab vs omalizumab was –5.31 (0.59; –6.46, –4.15;

POSTERS

$P < 0.0001$). SNOT-5 correlated more strongly with NPS than SNOT-22 across treatment groups (SNOT-5/22: 0.121 [95% CI -0.02, 0.27] and 0.029 [-0.12, 0.18] for dupilumab, 0.490 [0.36, 0.61] and 0.351 [0.19, 0.49] for omalizumab, respectively).

Conclusion:

Dupilumab led to rapid and sustained SNOT-5 improvements vs omalizumab for up to 24 weeks in patients with severe CRSwNP and coexisting asthma; SNOT-5 was more correlated with NPS than SNOT-22.

Poster #A061

Dupilumab tapering in CRSwNP: A systematic review

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Introduction:

Dupilumab is recommended for refractory chronic rhinosinusitis with nasal polyps (CRSwNP) at 300mg every 2 weeks (q2w). Long-term dose tapering or interval extension may reduce treatment burden and cost while maintaining efficacy, but evidence is limited and practice patterns vary.

Methods:

A systematic review was conducted following PRISMA guidelines. PubMed, Web of Science, and Cochrane Library were searched from June 2019 (FDA approval) through March 2026. English-language observational cohorts and randomized controlled trials evaluating dupilumab tapering or interval extension in CRSwNP were included. Two reviewers independently screened studies and data were narratively synthesized.

Results:

14 studies ($n=3042$ total, 1200 tapered) were analyzed. Interval extension from q2w to q4w was reported in 11 studies and stepwise tapering in 6; extended intervals $\geq q8w$ were achieved in 5 studies and $\geq q12w$ in 2. Tapering success, defined as maintenance of disease control for 6-24 months, was achieved in 70-95% of patients (10 studies), typically among those with sustained disease control prior to tapering and lower markers of type 2 inflammation. Maintenance of clinical outcomes

was reported for SNOT-22 score (10 studies), nasal polyp score (NPS) (9 studies), and olfactory function (4 studies), with no deterioration. Comparative analyses (3 studies) showed no significant differences in symptom burden, NPS, or quality of life between standard and extended interval dosing. Re-escalation occurred in 5-10% of patients across 8 studies.

Conclusion:

Dupilumab tapering is feasible in selected patients with CRSwNP. Evidence is largely observational, and prospective studies are needed to define optimal tapering strategies.

Poster #A062

Ecological analysis of sinonasal & nasopharyngeal cancer mortality & historical redlining practices

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Pratyusha Yalamanchi, Clinical Assistant Professor

Amarbir Gill, MD

Introduction:

Although racial and ethnic disparities exist in sinonasal and nasopharyngeal cancer outcomes, the impact of historical redlining practices on disease-specific mortality remains unknown.

Methods:

Age-adjusted sinonasal and nasopharyngeal cancer mortality rates (per 100,000; 2000 US population) were obtained from Surveillance, Epidemiology, and End Results (SEER) Research Data for 2000-2022 at the Health Service Area (HSA) level. Cancer sites were identified using SEER ICD-O-3/WHO 2008 site codes for "nasopharynx" and "nose, nasal cavity, and middle ear." Historical Home Owners' Loan Corporation (HOLC) grade polygons were spatially joined to HSA boundaries in Quantum Geographic Information System using area-weighted dominant grade assignment. HSAs were classified as Grade A ("Best"), B ("Still Desirable"), C ("Definitely Declining"), or D ("Hazardous"); ungraded HSAs were excluded. Negative binomial regression estimated incidence rate ratios (IRR).

Results:

Among 2,037 total deaths and 135 HSAs with

POSTERS

HOLC coverage, mortality rates increased with redlining severity: Grade B 0.23, Grade C 0.23, and Grade D 0.29 per 100,000. Grade A HSAs (n=3) were universally suppressed (<10 deaths per HSA), consistent with lowest expected mortality burden. Grade D HSAs demonstrated 14% higher mortality (IRR 1.14, 95% CI 0.92-1.43, p=0.23) versus Grade B. Sensitivity analyses using Grade A as reference suggested substantially higher Grade D mortality under conservative assumptions (IRR 4.10, 95% CI 1.11-19.7, p=0.04).

Conclusion:

Sinonasal and nasopharyngeal cancer mortality may be elevated in historically redlined neighborhoods. Ongoing county-level analyses with covariate adjustment are needed to validate these preliminary findings.

Poster #A063

Endoscopic skull base surgery post-operative complication rates: A national database analysis

Nicholas Sawicki, BA, MSc Candidate
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Introduction:

Endoscopic skull base surgery (ESBS) is a standard approach for anterior skull base lesions, yet post-operative complication data remain largely confined to single-center studies. This study characterizes postoperative complication rates across demographic subgroups using a large national patient database.

Methods:

The TriNetX platform was queried for patients undergoing ESBS between January 1, 2005 and December 31, 2025. Complications were identified using 37 ICD-10 codes spanning sinonasal, endocrine, neurological, infectious, vascular, and visual domains. Subgroup analyses by sex, age (≤ 59 vs. ≥ 60 years), race, and ethnicity were conducted with 1:1 propensity score matching.

Results:

A total of 16,597 patients were included. The most common complications included disorders of the nose and nasal sinuses (19.25%), followed by hypopituitarism (10.46%) and adrenocortical insufficiency (10.30%). CSF leak occurred in 3.96% of patients and meningitis in

1.12%. Males had significantly higher rates of hypopituitarism than females (26.6% vs. 14.2%; RR 1.87, p<0.001). Younger patients had higher rates of headache and diabetes insipidus, while older patients were more likely to develop hyponatremia. Black patients had higher rates of hypopituitarism and headache compared to White patients, whereas White patients had higher rates of hyponatremia.

Conclusion:

This national database analysis offers a more comprehensive view of ESBS complication rates than previously available. Sex-based differences in hypopituitarism and race-based differences in other outcomes suggest that post-operative risk is not uniform across patients, and future prospective studies should explore the underlying drivers.

Poster #A064

Endoscopic-guided resection of maxillary ameloblastoma: A case series

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Amin Javer, MD, FARS

Background:

Ameloblastoma (AM) is a benign tumor of odontogenic origin which can arise in the maxilla. Although benign in nature, these tumors grow aggressively, leading to destruction of surrounding tissue, bone, and nerves. The aim of this case series is to introduce an endoscopically guided, transoral method for the resection of maxillary ameloblastoma as a minimally invasive procedure, with appropriate tumor margins.

Cases Summary:

Our cases include that of a 64-year-old asthmatic male with a left maxillary sinus AM removed via transnasal endoscopic surgery, as well as a 63-year-old female with a left maxillary tumor and a 68-year-old male with a right maxillary tumor, both cases of recurring AM. For revision AM removal, the floor of the maxillary sinus was accessed through an incision on the upper jaw and endoscopic resection of tissue; involved areas of the maxillary bone were drilled without bony resection and facial reconstruction. Other areas of the maxillary sinus were resected using angled instrumentation. Endoscopic removal of

POSTERS

tumor and surrounding margins (1cm) was done to prevent recurrence. Post-op CT scans after 3 months show no recurrence for all cases.

Conclusion:

Endoscopic sinus surgery (ESS) offers a minimally invasive technique for sinonasal access. However, its application in ameloblastoma remains rare, with only 7 reported cases. ESS enables precise resection with enhanced visibility, while a transoral approach, can achieve wide-margin removal while minimizing facial incisions. This hybrid method is a promising option for managing maxillary AM without radical surgery, avoiding loss of function associated with maxillary bone resection while preventing tumor recurrence as seen with conservative methods.

Poster #A065

Endotype-guided CRS: Role of polyps & asthma

Linda Liu, MD

Endotyping has gained a pivotal role in the management of chronic rhinosinusitis (CRS), particularly with the new development of targeted biological therapies. Type-2-inflammation represents a dominant immunological pathway in CRS, although the exact pathomechanisms remain elusive. Eosinophil count has been shown to be one of the most relevant Type-2-marker and is recommended for further characterization of CRS according to EPOS. However, despite these recommendations, these markers are not routinely assessed in clinical settings, especially in primary care centers. Identifying easily obtainable clinical predictors of eosinophilic inflammation may therefore facilitate endotype stratification in routine practice. In our study, we investigated clinical markers which predict blood eosinophil count in CRS patients.

Clinical data from 540 CRS patients were analysed to evaluate factors associated with blood eosinophil count. Linear regression analysis using log-transformed eosinophil counts identified nasal polyps (45.2% increase, $p < 0.001$) and asthma (60.8% increase, $p = 0.032$) as independent predictors of peripheral eosinophilia. Allergic status (20.2% increase, $p = 0.092$) and male sex (19.2% increase, $p =$

0.072) showed trends toward higher eosinophil levels.

Nasal polyps and allergic status are independently associated with increased eosinophil levels in CRS. Thus, nasal polyp status and asthma co-morbidity might define a subset of patients in whom BEC measurement is informative for type 2 endotyping. Identification of CRS endotypes may improve risk stratification and enable more precise decision-making in routine clinical practice, especially in the emergence of biologic therapy and modern sinus surgery.

Poster #A066

Engineering an accessible simulation-based platform for flexible nasopharyngoscopy skill development

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Purpose:

Nasopharyngoscopy practice is limited by cost and restricted access to clinical flexible endoscopic systems. We developed a low-cost 3D printed simulation system and evaluated its effectiveness in improving trainee performance and reducing mucosal trauma during nasopharyngoscopy.

Methods:

A 2.5mm USB-C flexible borescope was integrated into a custom-designed 3D-printed handle (PLA, BambuLabs X1). Twenty medical students were randomized to hands-on practice with a 3D-printed nasal model ($n=10$) or unstructured practice ($n=10$). Participants performed a standardized insertion task on an anatomically accurate 3D-printed sinonasal cavity with a mucosal lining pre- and post-intervention (< 2 min). Outcomes included septal wall tissue displacement, mucosal contact events, and time to task completion. Secondary outcomes included user confidence, realism, and usefulness (5-point Likert). Data were analyzed using paired and independent t-tests.

Results:

Both groups improved on repeat testing, with greater gains in the training group. Tissue displacement decreased by a mean of 1.25 cm in the training group versus 0.3 cm in controls

POSTERS

($p < 0.01$). Mucosal contact events dropped a mean of 2.6 in the training group versus 0.7 in controls ($p < 0.01$). The training group reported increased endoscopy skills confidence. Participants rated the simulation as realistic (mean 3.9/5) and highly useful for learning endoscopic navigation (mean 4.1/5). Total system cost was \$70, compared to ~\$6,000 for a clinical system.

Conclusion:

A low-cost 3D-printed nasopharyngoscopy simulation significantly improves trainee performance and reduces mucosal trauma. This system provides a feasible platform for foundational nasopharyngoscopy training.

Poster #A067

ENT consults for nasal fractures in multi-trauma at a level I trauma center

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Introduction:

Nasal bone fractures are among the most common facial injuries and frequently occur in the setting of multisystem trauma. In level I trauma centers, evaluation and management are often initiated through inpatient otolaryngology consultation. This study describes the clinical characteristics and management patterns of multi-trauma inpatients with nasal bone fractures.

Methods:

We retrospectively reviewed multi-trauma inpatients who received otolaryngology consultation for nasal bone fractures at a level I trauma center from March 2024 to February 2026. Demographics, injury patterns, management, and follow-up outcomes were reviewed.

Results:

Thirty-three multi-trauma inpatients were included (mean age 48.3 ± 21.0 years; 27 male [81.8%], 6 female [18.2%]). Mechanisms of injury included falls (54.5%) and traffic accidents (24.2%). Alcohol involvement was identified in 27.3% of cases. Surgical intervention was performed in 45.5% ($n=15$), including 13 closed and 2 open reductions. Surgical timing was 0–24 hours in 13.3%, within 7 days in 46.7%, and 1–2 weeks in 40.0%. The

mean time from admission to ENT consultation was 4.4 ± 5.8 days. Among nonoperative patients (54.5%, $n=18$), management was deferred due to minimal or no displacement (61.1%), lack of symptoms or cosmetic concern (22.2%), patient refusal (11.1%), or competing clinical priorities (5.6%). Follow-up was completed in 87.9% of patients.

Conclusion:

Approximately half of multi-trauma inpatients with nasal bone fractures required reduction, highlighting the importance of timely ENT consultation for management within the treatment window.

Poster #A068

Environmental exposures, chronic sinusitis, and olfaction in people with Cystic Fibrosis

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Background:

Airborne pollutants may worsen chronic rhinosinusitis (CRS), but data on pollutant effects in people with cystic fibrosis and CRS (PwCF+CRS) are limited. PwCF are at heightened CRS risk due to impaired mucociliary clearance, predisposing them to treatment-resistant symptoms. This study assessed the effects of airborne pollutants in this population.

Methods:

In a multi-institutional cross-sectional study (2019–2023), 80 adults with CF+CRS were enrolled from U.S. academic rhinology clinics. Three-year mean pollutant exposures ($PM_{2.5}$, PM_{10} , CO, SO₂, NO₂, ozone) were estimated using EPA monitors linked to participants' ZIP codes. CRS severity was assessed via Lund-Kennedy (LK) and Lund-Mackay (LM) scores and patient-reported outcomes included SNOT-22, QOD-NS, and the 40-item Smell Identification Test (SIT). Spearman correlations assessed pollutant-

POSTERS

outcome associations.

Results:

Participants had a mean age of 35.1 years with 67.6% being female and 47.5% with nasal polyps (mean LK=7.1, LM=11.0). Higher ozone (O₃) exposure correlated with worse SNOT-22 scores (Rs=0.34, 95% CI: 0.12–0.52, p=0.002), including ear/facial, psychological, and sleep domains. O₃ also correlated with worse olfactory outcomes, higher QOD-NS (Rs=0.30, p=0.007) and lower SIT scores (Rs=-0.30, p=0.018). No other pollutants showed significant associations.

Conclusion:

Long-term O₃ exposure is associated with a modest increase in sinonasal symptom burden and olfactory dysfunction in PwCF+CRS, suggesting environmental ozone may contribute to disease severity in this population. These preliminary findings warrant further investigation with larger cohorts and adjustment for confounders.

Poster #A069

WITHDRAWN

Poster #A070

ESS is associated with lower incident depression, anxiety, and insomnia in CRSwNP

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Background:

Chronic rhinosinusitis with nasal polyps (CRSwNP) is associated with impaired quality of life and higher rates of depression, anxiety, and sleep disturbance. While endoscopic sinus surgery (ESS) is commonly performed for medically refractory disease, its association with subsequent mental health outcomes compared with medical management remains unclear.

Methods:

A retrospective cohort study was conducted using the TriNetX global research network. Adults with CRSwNP were identified and grouped into patients undergoing ESS and those managed medically. Propensity score

matching (1:1) was performed to balance demographics, comorbidities (allergic rhinitis, asthma, OSA), systemic corticosteroid exposure, and baseline psychiatric diagnoses. Primary outcomes were 1-year and 3-year incidence of depression, anxiety, insomnia, and related pharmacotherapy initiation.

Results:

After matching, 15,414 patients remained in each cohort. At 1 year, medically managed patients had higher rates of incident depression (2.1% vs 1.6%, RR=1.29, p=0.006), anxiety (2.8% vs 2.2%, RR=1.28, p=0.002), and insomnia (1.8% vs 1.2%, RR=1.47, p<0.001) than patients undergoing ESS. Initiation of SSRIs, SNRIs, and non-benzodiazepines was also more frequent in the medically managed cohort. At 3 years, differences in depression and medication initiation were no longer significant, but anxiety and insomnia remained more common among medically managed patients.

Conclusion:

Among patients with CRSwNP, ESS was associated with a lower 1-year incidence of depression, anxiety, and insomnia compared with medical management. These findings suggest that improved sinonasal disease control may be associated with better downstream mood and sleep outcomes.

Poster #A071

Evolution of AERD care: A 2017–2023 trend analysis of biologic therapy vs. aspirin desensitization

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Introduction:

Suboptimal management of Aspirin-Exacerbated Respiratory Disease (AERD) results in significant morbidity, including aggressive nasal polyp recurrence and frequent revision surgery. While traditionally managed with aspirin desensitization (AD), the 2019 FDA approval of Type 2 biologics for chronic rhinosinusitis with nasal polyps expanded the treatment paradigm. This study aimed to characterize changes in AERD treatment patterns.

POSTERS

Methods:

We conducted a retrospective cohort study in the Merative™ MarketScan® Commercial Database from 2016 to 2024. Patients with AERD were identified via ICD-10 codes for asthma, nasal polyposis, and NSAID sensitivity. Treatment modalities, including AD and biologic therapy, were identified using CPT® and National Drug Codes. Primary analyses explored temporal changes in the distribution of patients in AD monotherapy and primary biologic therapy treatment cohorts.

Results:

The analytic cohort included 1123 participants identified between 2017 and 2023, with a mean age of 46.6 years (SD 11.6) and 60.9% female. Longitudinal analysis revealed steady adoption of biologics as first-line therapy (60.0% in 2017 to 97.4% in 2023), concurrent with a decline in AD utilization (40.0% to 2.6%). A significant inflection point was observed between 2019 and 2020, with biologic utilization increasing from 76.2% to 94.6%.

Discussion:

Our study demonstrated a transition toward the use of Type 2 biologics in AERD management, accelerated by regulatory approval in 2019. Ongoing analysis of longitudinal changes in healthcare utilization – including surgical interventions, emergency department visits, and oral corticosteroid bursts – will characterize the impact of this therapeutic shift on patient outcomes.

Poster #A072

Evolving cause of mortality in sinonasal malignancy

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Introduction:

Sinonasal malignancies are rare with heterogeneous outcomes depending on histology, subsite, and stage. Prior studies have examined survival trends, but have not provided time-updated estimates that distinguish cancer-specific from other-cause mortality among

survivors. The aim of the study is to evaluate how mortality causes can change over time after surgical resection.

Methods:

Using the SEER database, 1,652 patients with surgically resected sinonasal SCC or nonsalivary adenocarcinoma were identified. Conditional cumulative incidence for cancer-specific and other-cause death was estimated at 1-, 2-, 3-, and 5-year timepoints. Multivariable Fine-Gray regression at each time point accounted for cancer characteristics and demographics.

Results:

Among 1-year survivors, the probability of cancer-specific mortality over the next 5 years was 19.7%, compared with 13.4% for other-cause mortality. Among 5-year survivors, cancer-related death fell to 6.3% while other-cause death rose to 20.6%. A shift occurred in the 3-year post-surgery survivors, where other-cause mortality surpassed cancer-specific mortality. On multivariable analysis, nasal subsite was independently associated with lower cancer-specific mortality across all landmarks (aHR 0.32-0.47, $p < 0.02$, ref = ethmoid). Higher T stage was also associated with progressively greater cancer-specific mortality at the 1-year landmark (T2–T4b aHR range 1.89-4.12, all $p < 0.025$, ref = T1). This effect was no longer significant by the 3-year landmark.

Conclusion:

Other-cause mortality surpasses cancer-specific mortality after 3 years of sinonasal cancer surgery. These findings can be potentially used to guide postoperative surveillance intervals based on variable risk.

Poster #A073

Ewing's sarcoma and recurrent epistaxis

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Introduction:

Ewing's sarcoma is a malignant small round blue cell tumor that typically arises in the long bones or pelvis of children and young adults. Primary involvement of the sinonasal tract is rare, particularly in older adults, and may present with nonspecific symptoms such as

POSTERS

epistaxis, leading to delayed diagnosis.

Case Description:

A 51-year-old man presented with intermittent epistaxis triggered by coughing. Nasal endoscopy demonstrated a vascular mass arising from the posterior nasal septum with obstruction of the choanae. Computed tomography revealed a $4.1 \times 2.5 \times 2.3$ cm soft tissue lesion without bony erosion or nodal disease. The patient underwent complete endoscopic resection with a planned 1-cm margin; intraoperative frozen section raised concern for malignancy, prompting extension to a limited posterior septectomy. Final pathology confirmed Ewing's sarcoma with CD99 positivity and EWSR1 gene rearrangement. Later imaging demonstrated no residual or metastatic disease. The patient received adjuvant multiagent chemotherapy and intensity-modulated radiotherapy. At two-year follow-up, he remains disease-free with preserved nasal function.

Discussion:

Sinonasal Ewing's sarcoma is rare and can mimic benign vascular or inflammatory lesions, particularly when presenting as isolated epistaxis. This case highlights the importance of maintaining a broad differential diagnosis. It demonstrates the role of complete endoscopic resection with intraoperative decision-making guided by frozen section analysis as part of a multidisciplinary treatment strategy.

Conclusion:

Atypical epistaxis should prompt evaluation for malignancy. Early diagnosis and coordinated oncologic care are essential for durable control and functionality.

Poster #A074

False positive beta-2 transferrin in a patient with rhinorrhea

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β 2-transferrin (β 2-Tf) is a transferrin isoform utilized to confirm CSF leak due to high sensitivity (87-100%) and specificity (71-100%). However, rare serum transferrin allelic variants

may contaminate rhinorrhea specimens. This may lead to false-positive results and unnecessary interventions. We present the case of a 37-year-old male who underwent endoscopic endonasal resection of a prolactinoma with an intraoperative CSF leak and repair. Three days after discharge, he developed rhinorrhea, which tested positive for β 2-Tf. Clinical symptoms, however, were equivocal and upon return to the operating room, no CSF leak was found. Given negative intraoperative findings, a serum β 2-Tf test was ordered and returned positive, indicating a possible initial false positive β 2-Tf. Although β 2-Tf testing is considered highly sensitive and specific, blood contaminated samples in patients with transferrin allelic variants, present in up to 4% of the population, can produce atypical electrophoretic banding that mimics β 2-Tf. Paired serum and rhinorrhea analysis is critical to avoid misdiagnosis, and an additional β -trace protein assay may improve diagnostic accuracy. We examine documented cases and theorized methods of action for false positive β 2-Tf testing that may be addressed through additional testing. This case highlights that the specificity of β 2-Tf for CSF rhinorrhea is not 100% accurate. This is especially important in postoperative patients, where retained blood clots and packing material may harbor serum proteins and lead to false positives. Therefore, this case supplements the literature on false positive β 2-Tf and demonstrates that adjunctive testing may be warranted when β 2-Tf, clinical symptoms, and/or imaging are discordant.

Poster #A075

Features of chronic rhinosinusitis in Somali patients

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Health disparities in chronic rhinosinusitis (CRS) have been described across socioeconomic and ethnic groups. However, limited data exist evaluating disease burden in Somali patients.

We performed a retrospective cohort study of adults with CRS. Somali patients were compared with non-Somali controls with respect to demographics, disease characteristics, healthcare utilization, follow-up rates, and

POSTERS

surgical outcomes. Statistical comparisons were performed using t-tests, Fisher's exact tests, and Wilcoxon rank-sum tests. Linear regression was used to evaluate follow-up timing while adjusting for age and sex.

70 Somali patients and 140 controls were included. Somali patients were significantly more likely to have public insurance (93% vs 35%, $p < 0.0001$). There were no significant differences in age, sex, BMI, nasal polyps, asthma prevalence, ER visits, rates of sinus surgery, or area deprivation index. Time to recommended follow-up after the initial visit was comparable (6.8 vs 6.6 weeks, $p = 0.77$), including a subgroup analysis limited to patients with public insurance. Somali patients had a higher number of total ENT clinic visits (7.5 vs 4.3 visits, $p = 0.019$). Linear regression demonstrated no difference in follow-up timing between groups. Patient-reported measures such as SNOT-22 were often unavailable in Somali patients, limiting subjective comparison.

Despite substantial differences in insurance status, Somali patients demonstrated similar features of CRS compared with non-Somali controls. These findings suggest that ethnicity alone may not be associated with worse CRS outcomes in this population, although differences in healthcare utilization and incomplete patient-reported outcome data highlight areas for future study.

Poster #A076

Frailty metrics fail to predict ESS outcomes in CF population

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Background:

Frailty is a clinical state of increased vulnerability due to reduced organ function and reserve. The Modified 5-Item Frailty Index (mFI-5) and Hospital Frailty Risk Score (HFRS) are two validated indices which have been used to predict clinical outcomes.

Objective:

To understand how these indices can predict adverse outcomes of sinus surgery in a cystic fibrosis (CF) population.

Methods:

We conducted a retrospective analysis of patients who underwent endoscopic sinus surgery for CF chronic rhinosinusitis at our institution. Charts were reviewed to collect ICD-10 diagnosis comorbidities and information to establish the mFI-5 and HFRS for each patient. We also collected data regarding adverse patient outcomes. Simple and multivariable logistic regression models were used for analysis.

Results:

94 endoscopic sinus surgeries across 46 patients were analyzed. Across all surgeries, the mean HFRS was 5.1 and the mFI-5 scores at the time of surgery were as follows: 0 (17%), 1 (63%), 2 (27%), 3 (6%), 4 (4%), 5 (0%). 30% of surgeries required rescue antibiotics, 11% required rescue steroids, 33% required perioperative admission, 6% had major complications including sepsis, post-operative dialysis, and pulmonary embolism. There was no statistically significant correlation between elevated frailty indices and the need for rescue antibiotics, rescue steroids, or required perioperative admission. Age was associated with an increased need for rescue antibiotics, and frailty indices were associated with lung transplantation status. The rarity of major complications precluded statistical analysis.

Conclusions:

Elevated frailty indices did not predict adverse outcomes for ESS in this population.

Poster #A077

From loss to distortion: Post-COVID parosmia

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Cindy Ejindu

Background:

Olfactory dysfunction is a common adverse effect of COVID-19, with a substantial proportion of patients eventually developing parosmia, a qualitative distortion of smell that often emerges during recovery from anosmia. While initially considered transient, recent longitudinal data suggest that parosmia may persist for years and significantly impact quality of life, prompting increased need for focus on targeted therapeutic interventions.

POSTERS

Objective:

To evaluate recent evidence on the prevalence, pathophysiology, and long-term outcomes of parosmia in relation to past COVID-19 infection.

Methods:

This narrative review evaluates current evidence on the prevalence, pathophysiology, and long-term outcomes of parosmia following COVID-19. A literature review was conducted using PubMed, Scopus, Web of Science, and the Cochrane Library. Search terms included parosmia, olfactory dysfunction, anosmia, COVID-19, and long COVID. Eligible studies include observational cohorts, cross-sectional studies, and case reports evaluating parosmia in the context of COVID-19.

Conclusion/results:

Parosmia is increasingly recognized as a delayed sequela of COVID-19, typically developing weeks to months following initial anosmia. Approximately 30–60% of patients with persistent olfactory dysfunction experience parosmia, ranging from 6 months to 2 years. Patients may report subjective improvements, but objective testing may reveal residual defects. Emerging therapeutic approaches, including olfactory training and platelet-rich plasma, have demonstrated potential benefit in improving olfactory function and symptom burden in recent controlled studies.

Poster #A078**From piercing to PEComa: Lessons from a rare sinonasal malignancy**

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Introduction:

Perivascular epithelioid cell tumors (PEComas) are rare mesenchymal neoplasms that co-express smooth muscle and melanocytic markers. They typically arise in the urogenital tract, retroperitoneum, and liver of younger women; sinonasal involvement is exceedingly rare. Treatment typically involves complete surgical resection, with consideration of mTOR inhibition and adjuvant radiation. We report a rare case of a sinonasal PEComa marked by rapid progression and delayed diagnosis, requiring complex oncologic resection and reconstruction.

Case:

A 21-year-old female noted a tender lesion over the right nasal ala. Initially, this was attributed to a nose ring infection. After failed antibiotic therapy, intranasal incision and drainage was performed; no purulence was encountered. The mass then rapidly enlarged, prompting OR biopsy that revealed PEComa. CT imaging demonstrated possible involvement of the anterior maxilla. After referral to a tertiary care center, she was started on sirolimus as a bridge to surgery, and 5 days later she underwent right hemirhinectomy, radical cheek resection, partial inferior turbinate resection, and biopsy of the maxilla. Histopathologic examination confirmed low-grade PEComa. Multidisciplinary tumor board did not recommend adjuvant radiation given the low-grade nature of the tumor. She then underwent local advancement flap of the cheek; nasal reconstruction is being delayed several months to allow for oncologic surveillance.

Conclusion:

Sinonasal PEComas are extremely rare tumors with the potential for rapid progression and invasion of critical structures. Early biopsy and diagnosis are essential to minimize morbidity. Management is complex and requires a multidisciplinary approach.

Poster #A079**Global patterns of CRS presentation and management**

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Introduction:

Chronic rhinosinusitis (CRS) is a heterogeneous condition with variation in clinical presentation and management. Global CRS characteristics and longitudinal outcomes remain poorly characterized. We aimed to assess regional differences in demographics, disease characteristics, and longitudinal outcomes in patients with CRS.

Methods:

This retrospective cohort study utilized the TriNetX global network, including adult patients with CRS over a 20-year period across the United States (US), Asia-Pacific (APAC),

POSTERS

Europe/Middle East/Africa (EMEA), and Latin America (LATAM). The index event was the first CRS diagnosis. Baseline demographics, comorbidities, and laboratory values were compared across regions. Longitudinal outcomes, including medical therapy and healthcare utilization, were assessed at 1-, 3-, and 5- year intervals.

Results:

Among over 3 million patients, significant demographic differences were observed across regions, including female predominance in the US and male predominance in APAC (<0.001). CRS characteristics varied, with the highest prevalence of nasal polyps in EMEA (14%) compared to the US (5%), APAC (6%), and LATAM (3%). Comorbidities, including asthma and allergic rhinitis, differed across regions ($p<0.001$), alongside variation in inflammatory markers, with higher IgE in APAC and EMEA. Regional differences in medical therapy were observed at all time points, although these patterns were less consistent across regions over time.

Conclusion:

CRS demonstrated marked global variation in demographics and disease expression. Differences in nasal polyp prevalence, comorbid conditions, and inflammatory markers highlight the importance of geographic context in CRS presentation and care patterns.

Poster #A080

GLP-1 RA use linked to smell/taste changes in overweight & obese patients by BMI

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Introduction:

Glucagon-like peptide-1 receptor agonists (GLP-1RAs) are increasingly prescribed for weight loss and diabetes management, but their olfactory and gustatory effects are poorly defined. We evaluate whether GLP-1RA use is associated with altered rates of anosmia, parosmia, and parageusia in overweight and obese patients.

Methods:

Retrospective cohort study using the TriNetX

Network (2018–2024) in adults with BMI $\geq$ 25 kg/m², excluding those with chronic rhinosinusitis, neurodegenerative disease, pregnancy, or prior skull base surgery. GLP-1RA users were compared with non-users via 1:1 propensity score matching (PSM) for age, sex, T2DM, and tobacco use. Outcomes were incident anosmia, parosmia, and parageusia with stratified analyses for BMI 30–40 and $\geq$ 40.

Results:

1,282,604 patients were included after PSM, with 641,302 GLP-1RA users and 543 patients with parageusia. After PSM, sensory dysfunction was rare in both cohorts. GLP-1RA users with BMI $\geq$ 25 had 196 (0.031%) cases of anosmia, 76 (0.014%) of parosmia, and 272 (0.044%) of parageusia, compared to 125 (0.027%), 38 (0.011%), and 271 (0.046%), respectively, among non-users. Overall, GLP-1RA use was associated with increased risk of anosmia (RR 1.57, 95% CI 1.26–1.97, $p<0.01$) and parosmia (RR 2.00, 95% CI 1.36–2.96, $p<0.01$), with no significant difference in parageusia (RR 1.01, 95% CI 0.85–1.19, $p=0.93$). In the BMI 30–40 and $\geq$ 40 subgroup, there were no statistically significant differences in anosmia, parosmia, and parageusia.

Conclusions:

Sensory dysfunction is rare in GLP-1RA use, but olfactory dysfunction risk may be elevated in patients with BMI $\geq$ 25. Clinicians may consider counseling these patients on potential smell disturbances when initiating GLP-1RAs.

Poster #A081

GLP-1 receptor agonists in CRSwNP: Clinical outcomes and mechanisms

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Background:

CRSwNP is a type 2 eosinophilic disease with variable response to existing methods of treatment. GLP-1 receptor agonists (GLP-1RAs) have been shown to suppress IL-33, NF- κ B, and eosinophilic pathways, crucial mechanisms of the pathophysiology of CRSwNP. Notably, the GLP-1 receptor (GLP-1R) has been shown to be expressed in nasal mucosa.

POSTERS

Methods:

A search was conducted via structured searches of PubMed/MEDLINE and Google Scholar using predefined clinical and mechanistic search terms. Studies were selected based on relevance to GLP-1RA mechanisms, CRSwNP pathophysiology, and available clinical outcomes data. 14 studies from 2014-2026 were included in the final review.

Results:

Chaaban 2026 (n=2,782 propensity-matched CRSwNP/obesity) demonstrated GLP-1RA use was associated with RR 0.64 for revision FESS at 1 year (p=0.04), RR 0.60 at 5 years (p=0.001), and RR 0.72 for first-time biologic prescriptions (p=0.04).

GLP-1R expression in nasal mucosa is suppressed by miR-21-5p in CRSwNP; GLP-1R agonists decrease IL-33 production in airway epithelial cells in vitro. Preclinical models show liraglutide and tirzepatide suppress IL-33, ILC2 activation, and eosinophilia via cAMP-PKA-DUOX1.

A meta-analysis of 136 RCTs (n=164,322) demonstrated 16% reduction in serious respiratory infections (RR 0.84). Obesity is independently associated with CRSwNP prevalence (OR 1.44) and glucocorticoid insensitivity in CRSwNP (OR 1.58).

Conclusion:

GLP-1RAs show both biochemical as well as clinical promise in the management of CRSwNP. This is likely due to sinonasal GLP-1R/IL-33 modulation, NF- κ B suppression, and ILC2 inhibition. This is the first mechanistic and clinical review of GLP-1RAs in the field.

Poster #A082

Health disparities in endoscopic skull base surgery: A scoping review

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Background:

Health disparities in otolaryngology contribute to measurable harms, including different

treatment utilization and excess morbidity and mortality. No study to date has attempted to characterize health disparities in skull base surgery literature, which needs specialized imaging and longitudinal follow-up. This scoping review aims to systematically evaluate the current landscape of skull base surgery health disparities and proposed areas for interventions.

Methods:

A search of PubMed, Embase, and Web of Science was conducted using terms related to skull base surgery and health disparities. The review adhered PRISMA-ScR guidelines. Studies were included if they were conducted in the United States and studied health disparities related to skull base care.

Results:

A total of 46 studies met the inclusion criteria. Disparities related to race/ethnicity (n= 32, 69.6%), socioeconomic status (n= 22, 47.8%), and sex/gender (n= 11, 23.9%) were most frequently examined. Nearly all studies focused on detecting disparities (n=45; 97.8%) with fewer aimed at understanding them (n=10; 21.7%) and none dedicated to reducing disparities. Some common themes focused on longer length of stays, increased mortality, more severe disease stages, and differences in treatment recommendations.

Conclusion:

Our review explored disparities literature in skull base surgeries and found significant discussions of treatments, disease stages, and progression of skull base tumors and cancers. There is a significant need for research that seeks to understand casual relationships behind disparities and develop interventions to reduce them.

Poster #A083

WITHDRAWN

Poster #A084

High-risk zip code and survival in endoscopically resected SNSCC

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POSTERS

Introduction:

Socioeconomic disparities are associated with worse oncologic outcomes. Sinonasal squamous cell carcinoma (SNSCC) is rare and requires specialized multidisciplinary care. We evaluated the impact of high-risk zip codes (HRZC) on treatment patterns and survival in patients undergoing endoscopic resection for SNSCC.

Methods:

The National Cancer Database (NCDB) was queried for adult patients with SNSCC diagnosed between 2010 and 2023 who underwent primary endoscopic resection. HRZC was defined as residence in areas within the lower two quartiles of median income or educational attainment. Overall survival (OS) was estimated using Kaplan–Meier analysis and compared using the log-rank test. Multivariable Cox regression identified factors associated with OS, and logistic regression evaluated associations between HRZC and treatment at academic centers and receipt of radiation therapy.

Results:

606 patients met inclusion criteria, of whom 345 (57.0%) resided in HRZC. Patients from HRZC were more likely to have government insurance ($p < 0.05$). Median OS was 128.2 months in the low-risk group versus 102.3 months in the HRZC group. One-, three-, and five-year OS were 91.9%, 76.5%, and 67.2% in low-risk areas compared to 88.4%, 71.2%, and 63.0% in HRZC (log-rank $p = 0.019$). On multivariable analysis, HRZC was not independently associated with OS (HR 1.17, 95% CI 0.92–1.49, $p = 0.216$). Worse OS was associated with older age, advanced T stage, nodal disease, higher comorbidity burden, and government insurance.

Conclusion:

HRZC is associated with worse unadjusted survival but not independently associated with OS after adjustment, suggesting disparities are mediated by differences in disease severity and access to care.

Poster #A085

Hyalohyphomycotic vs. non-hyalohyphomycotic invasive fungal sinusitis in heme malignancies

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Early detection and expedited management of invasive fungal sinusitis (IFS) in patients with hematologic malignancies can improve prognosis. Identification of fungal subtypes can reduce mortality by enabling targeted therapy. The hyalohyphomycosis group of mycoses is characterized by hyaline hyphae and includes the species *Aspergillus*, *Fusarium*, and *Scedosporium*. This study analyzes clinical features of hyalohyphomycotic vs. non-hyalohyphomycotic (e.g., *Mucor*, *Rhizopus*, *Alternaria*) IFS in hematologic malignancies.

This is a single-center, retrospective study of adults with hematologic malignancy and proven IFS. Descriptive statistics were used to characterize differences in fungal groups. Continuous variables were compared with Mann-Whitney U tests. Categorical variables were compared with chi-square or Fisher's exact tests.

Of 31 IFS patients, 16 cases were classified as hyalohyphomycosis and 15 as non-hyalohyphomycosis. There were no significant differences in age or gender. Acute myeloid leukemia was the most common malignancy in both groups ($p=0.55$). Sinonasal endoscopy findings and extent of infection did not differ between groups. Galactomannan and (1,3)- β -D-glucan biomarkers demonstrated low positivity in both groups (18.8% vs. 12.5%; $p=1.00$). Intracranial extension (6.3% vs. 13.3%) was similar in both groups ($p=0.60$). Orbital extension (12.5% vs. 40.0%) was more predominant in the non-hyalohyphomycosis group, but insignificant ($p=0.11$). Mortality did not differ between groups ($p=0.43$).

Clinical findings and fungal biomarkers did not reliably distinguish between hyalohyphomycosis and non-hyalohyphomycosis. Development of more accurate diagnostics can facilitate early fungal speciation and targeted antifungals.

POSTERS

Poster #A086

Imaging findings associated with persistent IIH after CSF leak repair

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Introduction:

Spontaneous cerebrospinal fluid (CSF) leaks are recognized as a manifestation of idiopathic intracranial hypertension (IIH). Although elevated intracranial pressure (ICP) imaging signs are established, their predictive value of recurrent leak or persistent ICP elevation after leak repair is unclear.

Methods:

Retrospective cohort of patients with CSF leak from 2017-2025. Cohorts defined as IIH and iatrogenic. Data collection included demographics, BMI, surgical details, radiologic studies, and postop outcomes. Statistical analysis: Mann-Whitney and Pearson Chi-Square tests.

Results:

219 patients: 73% Female, mean age 56 years (SD=14). IIH odds 3 times higher in females vs males (OR=3.0 95% CI 1.61-5.59 p=.0005). 14 subjects (6%) had recurrent CSF leak, all IIH; those with recurrent CSF leak more likely to have IIH than iatrogenic (OR=18.5, 95% CI 1.09-316.65, p=.04). BMI greater in IIH at 34.2 vs iatrogenic at 29.5 (p<.001). Mean leak symptom duration longer in IIH cohort: 17 months for IIH; 10 months for iatrogenic (p=.021). Defect size 9.6 mm IIH vs 4.9 mm iatrogenic (p<.001). Imaging features of elevated ICP were greater in the IIH group vs iatrogenic (p<.001). Within IIH, recurrent CSF leak had higher mean odds of: optic nerve tortuosity (OR=3.2 95% CI 0.65-15.58 p=.15), optic nerve sheath dilation (OR=2.5 95% CI 0.51-12.26 p=.26), posterior globe flattening (OR=2.6 95% CI 0.73-9.46 p=.14), and transverse sinus stenosis (OR=2.5 95% CI 0.19-32.2 p=.48) vs those without.

Conclusion:

IIH subjects had greater BMI, symptom duration, and defect size compared with iatrogenic subjects. Imaging findings associated with elevated ICP were strongly linked to the IIH cohort and associated with recurrent leak findings.

Poster #A087

Impact of sinus surgery on nitric oxide concentration in the maxillary sinus

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Introduction:

Chronic rhinosinusitis (CRS) affects up to 12% of adults and is frequently treated with functional endoscopic sinus surgery (FESS). However, FESS has a 20–30% failure rate, often due to biofilms and impaired mucociliary clearance. The “nitric oxide (NO) hypothesis” proposes that enlarging the sinus ostium during FESS reduces sinus NO concentration, weakening host defense. NO is produced by sinus epithelia, has bactericidal effects, and enhances mucociliary clearance. However, the quantitative relationship between ostium size and sinus NO remains unclear.

Methods:

A three-dimensional model of the nasal cavity and paranasal sinuses was constructed from a CT scan of a healthy subject and modified via virtual surgery to create four increasing maxillary ostium diameters representing FESS outcomes. Computational fluid dynamics (CFD) simulations modelled NO release and transport at a steady-state inhalation rate of 15 L/min and assuming a baseline sinus NO concentration of 9.1 ppm. Two values of the NO production rate were estimated from the literature.

Results:

Sinus ventilation increased, while maxillary sinus NO decreased sharply with ostium enlargement. At small ostium areas, NO levels remained within the physiological range (6–9 ppm). However, when the ostium size exceeded ~0.8 cm², NO concentration dropped below 1 ppm for both NO production rates.

Conclusions:

These findings support the NO hypothesis, showing that ostium enlargement increases

POSTERS

ventilation but lowers sinus NO concentration. Loss of NO's bactericidal and mucociliary effects may contribute to persistent sinus infection after FESS. Further research using multiple anatomies and experimental validation are needed.

Poster #A088

Improvements in symptoms and sense of smell with tezepelumab in severe, uncontrolled CRSwNP

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Background:

ESSENCE (NCT06706817) is an ongoing, phase 3b, multicenter, interventional, prospective, single-arm, open-label study of adults with severe, uncontrolled chronic rhinosinusitis with nasal polyps (CRSwNP) receiving tezepelumab.

Methods:

Eligible adults are receiving tezepelumab 210 mg subcutaneously every 4 weeks for 24 weeks plus standard of care. This interim analysis assessed the change from baseline through week 4 in symptoms (assessed daily; visual analogue scale [VAS]), sense of smell (assessed weeks 1/2/4; University of Pennsylvania Smell Identification Test [UPSIT]) and nasal blockage (assessed week 4; peak nasal inspiratory flow [PNIF]).

Results:

71 patients were included. At weeks 2/4, least squares (LS) mean changes from baseline in VAS scores for nasal blockage, difficulty sleeping, loss of smell, loss of taste and NP symptoms were -0.8/-2.6 (baseline mean, 9.4), -1.7/-3.3 (8.3), -1.4/-2.9 (7.2), -0.7/-2.1 (7.3) and -1.6/-3.2 (8.4), respectively; improvements were seen as early as days 3-8. Proportions of responders at weeks 2/4 for nasal blockage (VAS change from baseline ≤ -3), difficulty sleeping (change ≤ -1), loss of smell (change ≤ -3), loss of taste (change ≤ -1) and NP

symptoms (change ≤ -2.5) were 8.8%/32.1%, 59.6%/87.0%, 21.1%/48.6%, 32.4%/58.3% and 25.5%/50.0%, respectively. At weeks 1/2/4, LS mean changes from baseline (mean, 16.8) in UPSIT score were 4.8/6.7/8.7, respectively. PNIF increased from baseline (mean, 74.4 L/min) to week 4 (LS mean change, 17.2 L/min).

Conclusion:

Early and clinically meaningful improvements in sino-nasal symptoms, sense of smell and nasal blockage were seen in the first days to weeks of tezepelumab treatment in adults with severe, uncontrolled CRSwNP in ESSENCE.

Poster #A089

Inhaled methoxyflurane vs placebo for outpatient sinus procedures: A double-blind RCT

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Introduction:

The aim of this study is to investigate the effectiveness of methoxyflurane as a short-term analgesic during in-office sinus and turbinate reduction procedures compared to placebo.

Methods:

We present a double-blind, randomized, placebo-controlled trial of 100 participants undergoing sinus surgery or turbinate reduction/coblation procedures, with 56 participants recruited since February 2025 to date. Participants are equally stratified into sinus surgery or turbinate reduction groups, and randomly assigned to a methoxyflurane or placebo arm. Pain levels are assessed using a visual analog scale (VAS) questionnaire for pain, as the primary outcome. Participants also complete an anxiety questionnaire pre-operatively, intra-operatively, and post-operatively, using VAS questionnaires. Secondary outcomes include SNOT22 scores pre- and post-operatively to assess symptom improvement post-surgery.

Results:

Current results include 15 participants in the sinus/methoxy and sinus/placebo arms, and 11 in the coblation/methoxy arm and 13 in the

POSTERS

coblation/placebo arms. Methoxyflurane resulted in lower mean pain scores compared to placebo in both groups; 23.4mm for sinus/methoxy vs 37.7mm for sinus/placebo (p -value<0.05), 24.2mm for coblation/methoxy vs 34.5mm for coblation/placebo (p -value=0.17). There is no difference between anxiety scores in the sinus groups, but there is an increase in mean anxiety scores pre-op vs intra-op in the coblation/placebo group (p -value<0.05), while a decrease is seen in the coblation/methoxy group (p -value=0.78). Headache (5%) and transient dizziness (12%) are reported as adverse events.

Conclusion:

Methoxyflurane may be useful in improving patient anxiety and pain during in-office sinus surgery.

Poster #A090

WITHDRAWN

Poster #A091

Intra-orbital gas as a marker of aggressive orbital infection

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Introduction:

Emphysematous orbital cellulitis is a rare complication of acute rhinosinusitis characterized by intra-orbital gas and potential vision loss.

Methods:

We present a three-patient case series.

Results:

Three patients presented with rapidly progressive orbital symptoms with sinusitis and intra-orbital gas on imaging. A 31 year old (yo) female with acute sinusitis had intraconal gas and rapid visual decline with elevated intraocular pressure (IOP) of 28 mm Hg, requiring emergent canthotomy and endoscopic sinus surgery with intra-operative cultures positive for *Haemophilus influenzae*. Case 2 is an 8 yo female who had a medial subperiosteal abscess causing proptosis and extraocular movement restriction. She underwent endoscopic sinus surgery with orbital decompression, with cultures positive for Group

A *Streptococcus*. Case 3 is a 32 yo male with an odontogenic infection that spread to the sinuses and orbit, who had a medial subperiosteal abscess with an IOP of 39 mmHg, requiring canthotomy, orbital decompression, and sinus surgery. Cultures grew *Staphylococcus epidermidis* and *Prevotella* species, and dental extraction was performed.

Across cases, intraorbital gas occurred despite two infections without classic gas-forming organisms, and was associated with rapid progression requiring urgent surgical intervention. Published data is limited, with only two reports of vision preservation, while most cases describe vision loss. In contrast, all patients in our series achieved full visual recovery.

Conclusion:

Intra-orbital gas should be recognized as a marker of aggressive orbital infection and associated with poor visual outcomes. Early recognition and prompt surgical intervention may allow for vision preservation.

Poster #A092

Maxillary balloon dilation for odontogenic sinusitis: A multi-institutional case series

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Introduction:

Odontogenic sinusitis (ODS) accounts for up to 40% of chronic maxillary sinusitis. While ESS offers more immediate relief than dental treatment alone, it is technically challenging due to intense inflammation and often cannot be promptly scheduled. Given the advantages of an awake office procedure and limiting dissection in inflamed tissue, we reviewed our experience with in-office balloon dilation (BD) as a minimally invasive strategy for ODS.

Methods:

BDs were retrospectively reviewed for underlying ODS. Dental treatment was performed prior if applicable. Success was defined as symptom improvement exceeding MCID and endoscopic resolution of purulence.

POSTERS

ΔSNOT-22 and clinical factors were evaluated using Wilcoxon signed-rank, Mann-Whitney, and Fisher's tests.

Results:

Nine patients underwent maxillary BD for ODS. Mean preop SNOT-22 was 38.4 versus 28.6 postop (mean change -9.9, $p=0.078$), with 7/9 improving and 4/9 (44%) exceeding MCID. Postoperative purulence resolution achieved in 3/9 (33%). Patients with treatable dental pathology showed greater improvement than those without (-15.4 vs -3.0, $p=0.22$). Patients without CT ethmoid involvement improved more (-19.0 vs -5.3, $p=0.19$). Four of nine patients (44%) required subsequent ESS, including 3/4 with CT ethmoid involvement.

Conclusion:

In this small case series, BD with dental source control resulted in symptom improvement for most patients, with treatable dental pathology and absence of ethmoid disease trending toward better outcomes. However, purulence resolution in 33% and a 44% ESS rate suggest BD may not be sufficient for many patients. Larger studies are needed, but BD may offer immediate relief for symptomatic patients unable to undergo ESS promptly.

Poster #A093

Mepolizumab improves nasal symptoms and olfactory function in CRSwNP: Interim data from REALITI-N

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Background:

CRSwNP is associated with a high symptom burden, but real-world data are limited.

Methods:

REALITI-N is an ongoing 1-year observational cohort study of adult patients with CRSwNP receiving mepolizumab 100 mg SC every 4 weeks (mepo). Patients were enrolled into

prospective/partially retrospective (P/PR) or retrospective (R) cohorts based on their mepo start date. This post hoc analysis assessed changes from baseline to Months 3 and 6 in SNOT-22 overall and nasal domain scores in patients who received $\geq 3/4$ mepo doses by Month 3 or $\geq 5/7$ doses by Month 6 in the P/PR cohort and Sniffin' Sticks test scores in the R cohort at baseline and Month 12 (not available for P/PR cohorts).

Results:

In the P/PR cohort, 349 and 280 patients met the 3- and 6-month adherence criteria, respectively. Overall SNOT-22 scores improved versus baseline, from a mean (SD) of 53.1 (21.88) [$n=323$ patients with data available] to 36.4 (22.25) [$n=291$] at Month 3, and from 53.3 (22.25) [$n=261$] to 36.0 (22.81) [$n=198$] at Month 6. Improvements in the SNOT-22 nasal domain were observed by Month 3 (mean [SD] change from baseline: -6.0 [6.82], $n=270$) and Month 6 (-7.1 [7.39], $n=181$). In the R cohort ($n=72$), sense of smell improved from baseline to Month 12; the proportion of patients reporting anosmia decreased (62.5% to 19.4%), while normosmia and hyposmia increased from 4.2% to 30.6% and 18.1% to 25.0%, respectively (missing data: 15.3% and 25%).

Conclusion:

Mepolizumab provides real-world benefits to the symptom burden of patients with CRSwNP. Interim results show numerical improvements in sino-nasal symptoms by 3 months after intervention and olfactory function in the retrospective cohort, although data limitations apply.

Poster #A094

Mepolizumab improves work productivity and HRQoL in CRSwNP: REALITI-N at 3 and 6 months

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POSTERS

Background:

CRSwNP significantly impacts ability to work and quality of life, including sleep and fatigue.

Methods:

REALITI-N is a 1-year observational cohort study of adult patients with CRSwNP treated with mepolizumab (mepo) 100mg SC 4-weekly. Patients were enrolled into prospective/partially retrospective (P/PR) or retrospective (R) cohorts based on date of mepo initiation. This post hoc interim analysis describes change from baseline to Months 3 and 6 in work productivity (assessed by WPAI-GH score) and SNOT-22 sleep and fatigue domains in adherent patients ($\geq 3/4$ mepo doses by Month 3 or $\geq 5/7$ doses by Month 6). WPAI-GH outcomes include percent impairment while working (presenteeism) and work time missed (absenteeism).

Results:

In the P/PR cohort, 349 and 280 patients met 3- and 6-month adherence criteria, respectively. Presenteeism improved from baseline to Months 3 and 6 (LS mean [95% CI] change from baseline: -11.7% [-18.18, -5.31], $n=121$ with data available and -17.3% [-25.68, -8.92], $n=79$). Absenteeism numerically improved at both timepoints (-4.8% [-10.58, 1.07], $n=126$ and -5.9% [-12.68, 0.96], $n=82$). Activity impairment improved at Months 3 and 6 (-17.7% [-23.31, -12.07], $n=228$; and -21.5% [-28.30, -14.76], $n=155$). Improvement from baseline was observed in the SNOT-22 sleep and fatigue domains at Months 3 and 6 (P/PR cohort). Reductions were seen at Month 3 and were generally greater by Month 6 ($n=181$ with data available): mean (SD) change from baseline to Month 6 for sleep: -3.0 (4.26) and fatigue: -3.6 (4.88).

Conclusion:

For patients with CRSwNP, mepolizumab was associated with real-world benefits in patient-reported work productivity and activity impairment, sleep and fatigue, as early as 3 months.

Poster #A095**Modified Draf IIc vs. Draf III outcomes in CRS patients**

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Introduction:

Chronic rhinosinusitis (CRS) affects roughly 11% of the global population. While Draf III is standard for severe disease, its invasiveness increases complication risks. Modified Draf IIc (mDraf IIc) is a less invasive alternative using bilateral Draf IIb with anterior superior nasal septum resection, preserving the interfrontal septum and frontal sinus buttress.

Methods:

This retrospective study compared adult CRS patients undergoing revision surgery (mDraf IIc vs. Draf III) performed by a single surgeon. Primary one-year outcomes compared SNOT-22 scores, modified Lund-Kennedy (mLK) staging, and the need for major (under general anesthesia) and minor (under local anesthesia) revision procedures.

Results:

Thirty-five patients were analyzed (20 mDraf IIc and 15 Draf III). Demographic variables, including mean age (60 vs. 63 years, $p=0.443$), male sex (55.0% vs. 60.0%, $p=1.000$), baseline asthma (70.0% vs. 53.3%, $p=0.512$) and CRSwNP diagnosis (70.0% vs. 80.0%, $p=0.780$) were comparable. Biologics use was also similar (40.0% vs. 46.7%, $p=0.741$). At one year postoperatively, no statistically significant differences were observed between the mDraf IIc and Draf III cohorts in mean SNOT-22 scores (36.8 vs 30.3, $p=0.593$) or objective mLK staging (2.69 vs. 1.93, $p=0.355$). Furthermore, there was no significant difference in subsequent major revision surgeries under general anesthesia (5.0% vs. 6.7%, $p=1.000$).

Conclusion:

mDraf IIc offers comparable long-term subjective and objective outcomes to Draf III. By achieving similar disease control with a less invasive approach and reduced bone resection, it represents a viable alternative for complex frontal sinus disease, potentially reducing the overall surgical burden.

POSTERS

Poster #A096

Mucocele histopathology

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Objective:

Structured histopathology (SHP) has allowed for the identification of distinct endotypes in chronic rhinosinusitis (CRS), providing insight into underlying disease mechanisms and guiding targeted therapies. However, the histological profile of sinonasal mucoceles remains poorly characterized. We aim to compare the SHP features of CRS patients with sinonasal mucoceles with CRS patients without sinonasal mucoceles.

Methods:

Retrospective chart review was conducted on 543 patients who received functional endoscopic sinus surgery. Data were collected on demographics, co-morbidities, and SHP. Chi-squared, logistic regressions, and multivariate analysis were performed.

Results:

Twelve patients with sinonasal mucocoele and 531 non-sinonasal mucocoele controls were included. Compared to controls, sinonasal mucoceles exhibited significantly more fibrosis (88.3% vs 44.3%, $p < 0.008$). All other SHP variables were not significantly different between groups. Mucocoeles were also associated with a lower prevalence of atopy.

Conclusions:

Sinonasal mucocoeles demonstrate a predominantly fibrotic histopathologic profile with minimal inflammatory differences. These findings suggest mucocoele formation in CRS may be partly driven in part by a remodeling-dominant, non-type 2 disease process distinct from established CRS endotypes.

Poster #A097

Mucocele of the OCR presenting as CN VI Palsy

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Zachary Gersey

Nour Abdel-Azim

Background:

Mucocoeles of the opticocarotid recess (OCR) are rare expansile sphenoid sinus lesions with few reported cases. Abducens nerve palsy as the sole presenting manifestation has rarely been described in relation to sphenoid sinusitis. We report a case of mucocoele limited to the OCR presenting with isolated sixth nerve palsy managed endoscopically.

Methods:

A 29 year old male patient with no history of previous endoscopic sinus surgery or trauma presented with 1 week of horizontal diplopia without additional neurological deficits. CT imaging demonstrated opacification of the left OCR and MRI confirmed persistence of inspissated mucus with no additional intracranial or orbital lesions. The patient underwent endoscopic endonasal drainage and marsupialization.

Results:

Intraoperative findings confirmed a mucocoele limited to a well pneumatized OCR. Improvement of the abducens palsy was noted in the PACU with complete resolution at 1 week postoperatively. There were no post-operative complications.

Conclusion:

Sphenoid sinus pathology should be considered in the differential diagnosis of isolated abducens nerve palsy. Full neurological recovery is achievable when decompression is timely. The sphenoid sinus should be carefully evaluated on imaging in patients presenting with unexplained cranial nerve palsies.

POSTERS

Poster #A098

Multi-institutional evaluation of non-rhinogenic headache associated with rhinitis symptoms

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Introduction:

Non-rhinogenic headache (NRH) may present with rhinitis-like symptoms possibly through a shared neurogenic etiology. Existing literature is limited and largely originates from tertiary centres, restricting generalizability. We aimed to characterize NRH across both tertiary and community settings.

Methods:

A retrospective review was conducted of 1970 patients evaluated between January 2024–June 2024 by tertiary rhinologists and community otolaryngologists for new primary complaint of headache.

Results:

Among 184 included patients, median age was 46 (IQR 37, 58.5) and 65.8% were female (n=121). Nearly half (n=85, 46.2%) had no evidence of sinonasal inflammation on nasal endoscopy or imaging. This group had significantly lower rates of nasal congestion (n=43, 50.6%), discharge (n=31, 36.5%), postnasal drip (n=22, 25.9%), and anosmia/hyposmia (13, 15.3%) compared to those with inflammation (n=82, 82.8%; n=60, 60.6%; n=47, 47.5%; n=40, 40.4%, respectively). Forty-two patients (22.8%) had isolated headache without any sinonasal symptoms. Patients in the community setting were significantly more likely to have no evidence of inflammation (n=39, 62.9% vs. n=46, 37.7%).

Conclusion:

A substantial proportion of patients with headache and nasal symptoms lack objective evidence of sinonasal inflammation, supporting a diagnosis of NRH. This phenotype appears more common in community settings, highlighting the need for improved recognition

beyond tertiary care. Better NRH characterization may reduce wait time, misdiagnosis and unnecessary treatment.

Poster #A099

Nasal airway obstruction – influence on athletic performance in elite athletes

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The patency of the nasal airway plays a crucial, yet underrepresented role in the performance of elite athletes across all competitive disciplines. Nasal airway obstruction limits effective ventilatory airflow, critically impacting physiologic efficiency and perceived exertion, additionally having an unknown impact on an athlete's confidence. Structural pathology, including turbinate hypertrophy, septal swell body hypertrophy, nasal valve collapse, and chronic inflammatory conditions may significantly impair nasal airflow thereby hindering athletic output.

To quantify and measure the effect of nasal airway obstruction on athletic performance, 30 elite collegiate athletes aged 18 years and older were selected at 3 different sites to participate standardized performance examinations. Participants were measured under two conditions: obstructed and dilated nasal passages. Quantitative analysis found statistically significant improvement under both domains – endurance and confidence – when participants were in the dilated versus obstructed condition. These findings underscore the importance of recognizing nasal airway obstruction as a modifiable factor in athletic performance.

Athletes and clinicians should be made aware of emerging non-invasive and minimally-invasive therapies available that can substantially improve nasal patency, with potential benefits extending to all facets of the high-performance athlete lifestyle including training, competition, recovery, and confidence. An emphasis on future research utilizing novel treatments to synergize these positive downstream effects may find improvement in sleep and recovery quality, confidence and mindset, and physical output capabilities.

POSTERS

Poster #A100
WITHDRAWNPoster #A101
Nasal swab immune profiling defines CRS immunotypes by spectral cytometry

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Introduction:

Chronic rhinosinusitis (CRS) encompasses heterogeneous inflammatory states that remain incompletely defined at the cellular level. Nasal polyp status alone is insufficient to predict underlying immunopathology or treatment responses. We hypothesized that immune profiling of nasal swab cells by spectral cytometry could be used to define clinically actionable CRS endotypes.

Methods:

Nasal inferior turbinate (NIT) and nasopharynx (NPX) flocked swab samples were collected from adults with CRSsNP (n=24), CRSwNP (n=17), and non-CRS controls (n=17). A subset of subjects underwent longitudinal sampling post-operatively. Using high-parameter spectral flow cytometry surface and intracellular phenotyping >40 innate and adaptive immune cell subsets were quantified. PCA and heatmap visualization identified distinct endotypes.

Results:

Paired surgical tissue and swab samples confirmed concordant immune profiles, validating swab-based sampling as a surrogate for sinonasal tissue immunopathology. CRS subjects had significantly increased total CD45+ immune cells in NIT and NPX swabs versus controls. PCA revealed immunological heterogeneity irrespective of polyp status, with identification of four CD4 T cell-centric (TFH-high, TH2-high, TH1-TRM-high, TH17-high) and an ILC-high endotype. Endotype stability was demonstrated 3-6 months post-operatively, supporting that inflammatory profiles are

intrinsic to CRS-affected mucosa and not eliminated by standard therapeutic strategies.

Conclusion:

Nasal swab-based immune cell profiling corresponds to tissue-based profiling and identifies distinct CRS immune endotypes independent of polyp status, to enable future endotype-directed treatment selection and monitoring of therapeutic responses.

Poster #A102

Nasal tumoral calcinosis in end-stage renal disease

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Background:

Tumoral Calcinosis (TC) is a pathologic condition defined by calcium-phosphate crystal deposition in otherwise normal soft tissue. It is a rare complication of end-stage renal disease (ESRD) driven primarily by dysregulated calcium-phosphorus metabolism and secondary hyperparathyroidism, though adynamic bone disease and tissue injury have also been implicated. While TC commonly affects periarticular soft tissues, uremic TC can also present in the head and neck. However, nasal septal involvement is extremely rare, with only a few isolated cases in the literature.

Case presentation:

A 53-year-old male with ESRD on hemodialysis presented with a 7-month history of progressive bilateral nasal obstruction and recurrent epistaxis. Endoscopy demonstrated a large mass filling both nasal cavities with septal destruction and crusting. CT imaging showed a heterogeneous midline mass with bilateral extension to the nasal floor. The patient underwent computer-assisted resection, septoplasty, and bilateral inferior turbinate reduction. Resection involved a combined endonasal and open transcolumellar approach to expose and excise the entire mass. There was extension of the mass over the hard palate along the nasal floor. Final pathology confirmed TC.

Discussion:

Unlike prior reported cases of TC in the head

POSTERS

and neck, this case presented with nasal septal destruction mimicking malignancy. The resultant surgical complexity highlights the significant morbidity TC can impose when involving the nasal cavity.

Conclusion:

TC should be included in the differential diagnosis for destructive sinonasal masses, particularly in dialysis-dependent patients, as early recognition can guide timely, multidisciplinary surgical and clinical planning.

Poster #A103

Nodal burden predicts survival in sinonasal neuroendocrine carcinoma

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Background: Sinonasal neuroendocrine carcinoma (SNEC) is a rare and aggressive malignancy with limited data to guide prognostication and treatment. Factors most strongly associated with survival remain poorly defined. This study evaluates clinicopathologic predictors of overall survival (OS) in a national cohort.

Methods: Patients with SNEC diagnosed between 2004–2023 were identified from the National Cancer Database. Demographic, staging, and treatment variables were analyzed. OS was assessed using univariate and multivariable Cox proportional hazards models. Kaplan-Meier analysis with pairwise log-rank testing was performed to evaluate survival differences by treatment type and nodal stage.

Results: A total of 272 patients were included with median follow-up of 56.3 months. The cohort had a mean age of 58.0 ± 14.8 years and was predominantly male (61.8%) and White (85.7%). Most patients presented with advanced disease, including stage IV (66.2%) and T4 tumors (61.8%). Increasing age, male sex, and higher nodal stage were associated with worse OS. On multivariable analysis,

increasing age (HR 1.04 per year, $p < 0.001$), higher nodal stage ($p < 0.001$), and advanced tumor stage, specifically T4 (HR 1.67, $p = 0.04$), were associated with worse OS. Kaplan-Meier analysis demonstrated decreased survival with increasing nodal burden, with clear separation of survival curves at the N2 stage.

Conclusions: Nodal burden is the dominant predictor of survival in SNEC, exceeding the prognostic impact of T stage and treatment modality. These findings highlight the importance of nodal disease in risk stratification and suggest that greater emphasis on regional disease control and staging may improve clinical decision-making.

Poster #A104

Olfactory testing and treatment practices among rhinologists

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Objective:

Olfactory dysfunction (OD) is associated with impairment in quality of life and impacts on cognitive/physical health. Several validated psychophysical olfactory tests are available, but uptake in clinical practice remains variable. The aim of this study was to describe current approaches to olfactory assessment and management among members of the American Rhinologic Society.

Design:

A cross-sectional online survey was developed via iterative review with experts in olfaction. The survey was distributed in two cycles to all members of the American Rhinologic Society.

Results:

Of 870 active members emailed, 88 completed the survey (response rate 10.1%). The study cohort comprised mostly subspecialists practicing in academic settings (59.1%). The monthly volume of patients with primary

POSTERS

olfactory dysfunction was generally low—with 78.4% of respondents seeing 10 or less patients/month. Testing was infrequently utilized for routine evaluations for chronic rhinosinusitis (CRS). For primary anosmia, only 54.6% reported using olfactory testing at least “most of the time.” The University of Pennsylvania Smell Identification Test emerged as the primary testing instrument (69%), while the SNOT-22 was the most utilized patient-reported outcome measure. Significant barriers included time/difficulty of administration, lack of insurance reimbursement/billing codes, and the cost of testing materials. Additionally, ¾ of respondents reported no compensation for olfactory testing.

Conclusions:

Although most respondents were familiar with validated olfactory testing tools, use of these tools routinely remains limited. Considerable variation was observed in both diagnostic and treatment approaches.

Poster #A105

One-year outcomes of ESS with short-term Dupilumab in type 2 CRSwNP

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Introduction:

Recent evidence indicates that combining endoscopic sinus surgery (ESS) with short-term biologic therapy may improve disease control in chronic rhinosinusitis with nasal polyps (CRSwNP). This study evaluated one-year outcomes following ESS with adjunctive short-term dupilumab and explored clinical and histopathologic features associated with recurrence.

Methods:

We retrospectively analyzed patients with type 2 CRSwNP who underwent bilateral ESS followed by dupilumab. All patients fulfilled EUFORA 2023 criteria and received at least three doses. SNOT-22 score and total nasal polyp score (NPS) ≥ 2 were evaluated one year after the final dose. Histopathologic slides were reviewed for basement membrane thickness, goblet cell hyperplasia, epithelial sloughing, and

submucosal gland proliferation. Comparisons were performed using the chi-square test.

Results:

A total of 32 patients were included (mean age 46.3 years; 62.5% male). The mean blood eosinophil count was 460 ± 275 cells/ μ L, and all patients demonstrated tissue eosinophilia. The mean number of doses administered was 5.53 ± 3.05 . At one year, 3 patients had SNOT-22 >40 and 5 had NPS ≥ 2 . No patients required revision surgery. Patients with recurrence showed lower rates of fibrosis (0% vs. 33%) and edema (25% vs. 50%) than those without recurrence; however, these differences were not statistically significant.

Conclusions:

Combined bilateral ESS and short-term dupilumab resulted in adequate one-year disease control in type 2 CRSwNP. The relationship between histopathologic features and long-term recurrence warrants further investigation.

Poster #A106

Outcomes of aspirin desensitization vs. biologic therapy in AERD

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Introduction:

Aspirin therapy after desensitization (ATAD) has been the mainstay of AERD management, but increasing utilization of biologics has been recognized recently. Data regarding the comparative efficacy of biologics versus ATAD is lacking.

Methods:

Electronic health records of a multistate healthcare system were reviewed to identify AERD patients managed with ATAD or biologics (dupilumab/mepolizumab/benralizumab/omalizumab) for >6 months. Demographics, ESS performance, and disease severity markers at baseline and follow-up were collected and compared between ATAD and biologic groups.

POSTERS

Results:

We included 148 AERD patients: 79 (53.3%) managed with ATAD and 69 (46.6%) with biologics. Patients were older in ATAD vs. biologics group (mean 60.3 vs. 55.4 years; $p=0.043$). Sex distribution (49.3% females in both), follow up period (median 61 vs 50 months; $p=0.366$), type-2 comorbidities (32.9% vs. 39.1%; $p=0.538$) and anti-leukotriene use (89.9% vs. 82.6%; $p=0.294$) were similar between groups.

Baseline as well as follow-up disease severity markers including Lund Kennedy scores, Lund Mackay scores, SNOT-22 scores, serum eosinophilia, ACT scores, and uLTE4 levels were similar between groups. Fewer patients needed revision ESS in biologics group (7.2% vs. 21.5%; $p=0.015$), however they needed it earlier after initiating therapy (median 4 vs. 27 months; $p=0.002$).

Conclusions:

Both ATAD and biologics decreased markers of AERD severity over a similar follow-up period. Treatment with biologics reduced the need for post-therapy ESS by a greater degree than ATAD. Biologics may have stronger surgery-sparing capabilities in AERD patients, albeit at significantly higher healthcare costs.

Poster #A107

Outcomes of ESS for CRS in PCD: A systematic review

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Introduction:

Endoscopic sinus surgery (ESS) outcomes for chronic rhinosinusitis (CRS) are well described in populations such as cystic fibrosis; however, evidence for patients with primary ciliary dyskinesia (PCD) remains limited. PCD presents unique CRS pathology due to impaired mucociliary clearance.

Objective:

This systematic review aims to synthesize available evidence and evaluate the consistency and strength of reported outcomes of ESS in PCD patients with CRS to guide future research.

Methods:

A systematic literature review was conducted following PRISMA 2020 guidelines. A literature search was performed across PubMed and Google Scholar. Eligibility criteria included postoperative outcomes for individual patients or cohorts with confirmed PCD who underwent ESS for CRS. Data extraction included study design, demographics, and clinical outcomes, which were summarized descriptively.

Results:

Sixty-eight records were screened; eight met inclusion criteria; 8/8 (100%) were single-institution observational studies between 1993–2023. Sinonasal symptoms and quality-of-life (QOL) outcomes were reported in 5/8 studies (62.5%), most using validated instruments (e.g., SNOT-22). Pulmonary function outcomes (FEV₁), microbiologic outcomes, and revision surgery were also reported in 5/8 studies (62.5%). Follow-up duration, outcome selection, and reporting completeness varied substantially across studies.

Conclusion:

ESS is associated with improvement in sinonasal symptoms and patient-reported QOL in PCD patients. However, the evidence is limited by small sample sizes, retrospective study designs, and heterogeneous outcome reporting. Prospective studies using standardized disease-specific measures are needed.

Poster #A108

Patient global impression of disease change and severity with dupilumab vs placebo in AFRS

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Objective:

This post hoc analysis of LIBERTY-AIMS assessed the effect of dupilumab on patient

POSTERS

global impression of change (PGIC) and severity (PGIS) vs placebo in patients with allergic fungal rhinosinusitis (AFRS).

Methods:

In LIBERTY-AIMS, a phase 3 placebo-controlled clinical trial (NCT04684524), patients ≥ 6 years of age with AFRS were randomized to dupilumab (300 mg every 2 weeks [q2w] [adults and children ≥ 60 kg] or 200 mg q2w [children ≥ 30 – <60 kg]) or matched placebo for 52 weeks. The numbers and proportions of patients with a PGIC score of 0 (scale 0–6; 0 = “Very much better,” 6 = “Very much worse”) and a PGIS score of 1 (scale 1–4; 1 = “None,” 4 = “Severe”) through Week 52 are reported.

Results:

Overall, 62 patients were randomized (dupilumab, $n=33$; placebo, $n=29$). The proportions (n/N) of patients treated with dupilumab/placebo reporting a PGIC score of 0 at Weeks 12, 24, and 52 were 61.3% (19/31)/3.8% (1/26), 75.0% (21/28)/8.0% (2/25), and 86.4% (19/22)/10.0% (2/20), respectively. The proportions of patients treated with dupilumab reporting a PGIS score of 1 at Baseline and Weeks 12, 24, and 52 were 0.0% (0/27), 21.2% (7/33), 32.1% (9/28), and 45.5% (10/22), respectively. No patients treated with placebo reported a PGIS score of 1 at any of the timepoints assessed.

Conclusion:

In this post hoc analysis of LIBERTY-AIMS, more patients with AFRS treated with dupilumab vs placebo reported the lowest scores in PGIC and PGIS indicating better symptom control and decreased symptom severity through Week 52, with proportions increasing over time.

Poster #A109

Patient reported outcomes and minimal clinically important difference after endoscopic DCR

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Objective:

The TEARS-12 is a validated patient-reported outcome measure for epiphora. Prior work established its utility at 6 weeks after endoscopic dacryocystorhinostomy (DCR); outcomes beyond this and the minimal clinically important difference (MCID) remain undefined. This study reports TEARS-12 outcomes through 17 months and establishes distribution-based MCID estimates.

Methods:

Prospective single-institution cohort undergoing endoscopic DCR (2020–2024). TEARS-12 (0–60; higher=worse) was administered pre-operatively and at 1 week, 6 weeks, and extended follow-up (3–17 months) via REDCap. Internal consistency was assessed with Cronbach's alpha. MCID was estimated using the half standard deviation (0.5SD), standard error of measurement (SEM), and minimal detectable change (MDC95). Paired changes were analyzed with Wilcoxon signed-rank tests.

Results:

107 patients enrolled (mean age 56.5 ± 16.3 years; 13.1% revision). Baseline mean TEARS-12 was 31.0 ± 13.6 . At 1 week ($n=84$ paired), mean score was 12.9 ± 13.0 (change -17.8 ; $p < 0.0001$; $d=1.10$). At 6 weeks ($n=84$), mean score was 10.6 ± 12.5 (change -20.4 ; $p < 0.0001$; $d=1.33$); 22.6% achieved complete resolution (score=0) and 70.2% exceeded the MDC95 threshold. Extended follow-up ($n=11$; 3–17 months) demonstrated sustained improvement (mean score 14.9 ± 12.5 ; change -11.2 ; $p=0.025$). Cronbach's alpha was 0.888. MCID estimates: SEM=4.5, 0.5SD=6.7, MDC95=12.4 points.

Conclusion:

Endoscopic DCR produces large, durable improvements in TEARS-12 from the first post-operative week through extended follow-up. Distribution-based MCID estimates range from 6.7 to 12.4 points. Anchor-based MCID validation is ongoing to establish patient-derived thresholds for clinical interpretation.

POSTERS

Poster #A110

PDE2a inhibition reduces nasal tuft cell calcium signaling and IL-25 release

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Tuft cells are enriched in nasal polyps and are likely a primary epithelial source of IL-25 in chronic rhinosinusitis with nasal polyps (CRSwNP). Tuft cells use taste-receptor-like signaling involving G-protein-coupled receptors, $G\alpha$ -gustducin, and Ca^{2+} to drive downstream mediator release. We previously showed that sweet taste receptor activation represses tuft cell responses, possibly through cAMP. Here, we investigate whether directly targeting the cAMP/phosphodiesterase (PDE) pathway could reduce tuft cell Ca^{2+} signaling and IL-25 secretion.

We used TRPM5-GFP mouse nasal epithelial cells and primary human nasal epithelial cells grown at air-liquid interface (ALI). Ca^{2+} and cAMP were measured by live cell imaging. Defensin and IL-25 secretion were quantified by ELISA. PDE gene expression was examined using publicly available single-cell RNAseq datasets.

In mouse nasal tuft cells, T2R bitter agonists and A1 adenosine receptor agonists both activated Ca^{2+} and reduced cAMP; these changes were blocked by pertussis toxin, a $G\alpha$ -gustducin inhibitor. Single-cell RNAseq data showed tuft cell enrichment of PDE2a. PDE2a inhibitors (PF-05180999, BAY 60-7550) increased cAMP in mouse tuft cells and reduced Ca^{2+} responses to denatonium, succinate, and adenosine receptor agonists. In human nasal ALI cultures, PDE2a inhibitors reduced denatonium-induced Ca^{2+} responses, defensin release, and IL-25 secretion without increasing ciliary beat frequency, consistent with some specificity for tuft cells over ciliated cells.

Modulating cAMP via PDE2a inhibition can reduce nasal tuft cell Ca^{2+} signaling and IL-25 secretion. These data support further investigation of cAMP-modulating strategies to quiet tuft cell-driven inflammation in CRSwNP.

Poster #A111

Pediatric acute complicated sinusitis with orbital superior/lateral subperiosteal abscess outcomes

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Pediatric acute sinusitis is a serious condition which requires multidisciplinary surgical intervention for orbital involvement. In those patients with superior or lateral orbital subperiosteal abscess (s/l SPAs), the importance of endoscopic sinus surgery (ESS) timing and frontal sinus surgical intervention during ESS on post-operative outcomes remains unclear.

This retrospective cohort study reviewed patients with s/l SPAs treated at a single institution from 2011-2023. Data collected included surgical interventions, length of stay, and need for subsequent procedures. Patients with ESS at the time of the initial orbitotomy versus delayed ESS were compared, with subgroup analysis of frontal sinus surgical intervention. Seventy-four patients were included: 65% were male (n=47), 35% were female (n=27), with an average age of 9.86 years (range 0.08-17 years). Most underwent ESS during the initial procedure (93%, n=66) with 48% of surgeries involving the frontal sinus. Patients with ESS had shorter average length of stay compared to those who did not (10.83 vs 14.4 days), without statistical significance (p=0.19). The rate of return to the operating room did not differ between patients with initial versus delayed ESS (1.16 vs 1.22, p=0.77). Between the patients who underwent frontal sinus intervention with ESS, there were no differences in average length of stay (12.88 vs 15.31 days, p=0.35) and operating room returns (1.15 vs 1.28, p=0.24).

This study suggests ESS at the time of orbitotomy for patients with s/l SPAs, as opposed to delayed ESS, may result in shorter hospital stays. Though these findings suggest a clinical difference in outcomes, they did not reach statistical significance, likely due to a limited cohort.

POSTERS

Poster #A112

Pediatric AFRS recurrence: A systematic review and meta-analysis

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Background:

Pediatric allergic fungal rhinosinusitis (AFRS) is an immunologically mediated subtype of chronic rhinosinusitis (CRS) characterized by aggressive local disease and recurrence. The epidemiology of pediatric AFRS is incompletely defined; adult AFRS accounts for approximately 5–10% of CRS, while incidence or prevalence in children remain unclear. Recurrence patterns are well described in adults, but long-term outcomes and predictors of recurrence in children remain poorly characterized.

Methods:

A systematic review and random-effects meta-analysis evaluated postoperative recurrence in pediatric AFRS. Studies were categorized as “confirmed AFRS” or “consistent with AFRS” based on diagnostic criteria. Clinical presentation, radiographic findings, and reported fungal species were summarized. Pooled recurrence proportions were calculated using Freeman–Tukey double arcsine transformation with restricted maximum likelihood estimation. Subgroup analyses evaluated perioperative corticosteroid utilization, and meta-regression evaluated associations between recurrence, orbital involvement, and serum IgE.

Results:

Twelve studies (242 patients) met inclusion criteria. Postoperative recurrence occurred in ~30% of patients (95% CI 20–50%) with moderate heterogeneity ($I^2 \approx 66\%$). Subgroup analyses showed differences across studies reporting corticosteroid therapy, though not statistically significant.

Conclusions:

Recurrence in pediatric AFRS occurs in approximately one-third of patients. Heterogeneity likely reflects differences in disease severity, management strategies, and surveillance practices. Standardized diagnostic criteria, explicit reporting of therapy, and prolonged follow-up are needed to better define recurrence risk.

Poster #A113

WITHDRAWN

Poster #A114

WITHDRAWN

Poster #A115

Post op complications and ICU utilization after EETS

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Background:

Endoscopic transsphenoidal surgery (ETS) is the primary surgical approach for pituitary tumor resection. Following surgery, current protocol involves admission to the Intensive Care Unit (ICU) for close monitoring. ICU admissions are resource-intensive and costly to the global healthcare system.

Objective:

Investigate patient risk factors that are associated with critical and non-critical complications to stratify patients who may require ICU admission post-operatively.

Methods:

Retrospective chart review at a single tertiary referral center.

Results:

A total of 146 surgeries were included in the study. 68 subjects were female, and 78 subjects were male. Mean age was 56.7 years. Average ICU length of stay was 2.9 days, and average total hospital length of stay was 5.3 days. Hypertension ($n=85$, 58.2%) and obesity ($n=77$, 52.7%) were the most common pre-operative risk factors. The most common complication was diabetes insipidus ($n=22$, 15.9%), followed by CSF leak requiring operative repair ($n=5$, 3.4%) and epistaxis requiring operative control ($n=3$, 2.1%). OSA was associated with strong association of postoperative critical complications (OR 24.0, 95% CI 2.2-267.5, $p=0.01$), while HTN was not associated with significantly increased risk of critical complication (OR 0.638, 0.11-3.73, $p=0.62$). Patients with hypertension and intra-operative CSF leak had increased ICU length of stay by 39.9% and 32.9% respectively.

POSTERS

Conclusion:

History of OSA is associated with increased risk of critical complications, while hypertension, and intra-operative CSF leak are factors requiring prolonged ICU monitoring.

Prospective studies are needed to validate risk stratification strategies and optimize post-operative ICU utilization.

Poster #A116

Postoperative outcomes following endoscopic sinus surgery under TIVA vs IA

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Background:

Anesthetic technique may influence postoperative recovery and complication rates following endoscopic sinus surgery (ESS). This study evaluates postoperative outcomes following ESS among patients receiving propofol-based Total Intravenous Anesthesia (TIVA) versus Inhalational Anesthesia (IA).

Methods:

TriNetX was queried to identify adults undergoing ESS between 2012 and 2022. Two cohorts were defined: patients receiving TIVA and patients receiving IA. Outcomes within 90 days post-op included epistaxis, anosmia or hyposmia, postoperative nausea and vomiting (PONV), and reoperation. Propensity score matching was performed to balance demographic, clinical, and procedural characteristics. Risk ratios (RRs), hazard ratios (HRs), and Kaplan-Meier survival analyses were conducted.

Results:

After propensity score matching, 2,066 patients were included in each cohort. Epistaxis was higher in the IA group although statistically insignificant (4.6% vs 3.4%; HR 1.303 [95% CI 0.958-1.773]; log-rank P = .090). Anosmia/hyposmia was significantly higher in the IA group (7.4% vs 2.6%; HR 2.840 [95% CI 2.077-3.882]; log-rank P < .001). PONV was similar (2.4% vs 2.7%; HR 0.857 [95% CI 0.583-1.260]; log-rank P = .433). Reoperation rates

were similar (1.8% vs 1.4%; HR 1.270 [95% CI 0.777-2.075]; log-rank P = .339). Kaplan-Meier analysis demonstrated a significant difference in time-to-event for anosmia/hyposmia only.

Conclusion:

In ESS, IA was associated with a significantly higher incidence of postoperative olfactory dysfunction compared to TIVA, without differences in PONV, reoperation, or epistaxis risk. These findings suggest anesthetic technique may influence postoperative outcomes following ESS warranting further investigation.

Poster #A117

WITHDRAWN

Poster #A118

Post-rhinoplasty obstruction discordance

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Background:

Persistent nasal symptoms, including perceived obstruction and rhinorrhea-like sensations, are frequently reported after rhinoplasty despite anatomically successful outcomes and adequate objective airflow. Structural explanations alone do not account for ongoing subjective complaints in patients with normal postoperative anatomy. This review proposes a sensory-airflow discordance model.

Methods:

A narrative review of PubMed-indexed literature (2016–2026) was conducted. Studies on nasal airflow dynamics, trigeminal nerve-mediated sensory perception, mucosal physiology, and postoperative rhinoplasty outcomes were included. Evidence from nasal sensory neurophysiology and airflow perception research was synthesized.

Results:

Objective measures show improved airflow in ~75–90% of patients, with NOSE score improvements averaging 40–70 points. Despite this, 10–25% report persistent abnormal sensations, including airflow dysesthesia and rhinorrhea-like perceptions, despite normal structure. Nasal patency perception depends heavily on trigeminal afferent signaling related to mucosal cooling, humidity, and airflow patterns rather than airflow volume alone. Surgical changes to nasal valve geometry can

POSTERS

alter airflow distribution and sensory feedback without reducing patency, creating a mismatch between measured airflow and perceived function. Postoperative neural adaptation and altered central trigeminal processing may further distort sensory input.

Conclusion:

Post-rhinoplasty symptoms may reflect altered neuro-sensory processing rather than structural failure. Recognizing sensory-airflow discordance, including rhinorrhea-like misperception, offers a framework for evaluation and may reduce unnecessary revision surgery.

Poster #A119

Predicting response to Mepolizumab: A clinical and transcriptomic analysis

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Objectives:

Sixteen patients with CRSwNP received six injections of mepolizumab, a Type 2-targeting anti-IL 5 monoclonal antibody, in a prospective, single arm trial. Response, defined as a reduction in nasal polyp (NP) score of $\geq 1/8$, was achieved by 72% of patients at the six month time point. We sought to identify clinical and transcriptomic factors associated with clinical response.

Methods:

Nasal epithelial brushings were obtained at beginning and end of treatment, and RNA was extracted for sequencing. Clinical data and gene expression at baseline and 24 weeks were compared for responder and non responder groups.

Results:

Self reported history of allergic rhinitis (responders: 60.0%; non responders: 14.3%; $p=0.024$) was associated with response to mepolizumab. Other Type 2 comorbidities did not influence treatment outcome. Transcriptomic analysis demonstrated inflammatory, metabolic, and epithelial patterns that differed between responders and non responders both i) prior to and ii) after treatment. Prior to treatment, responders

showed higher overall transcriptional activity, but relative suppression of signaling pathways, implicating both epithelial and immune cells. After 6 months of treatment, responders exhibited activation of chromatin remodeling pathways, suggesting modulation of activity in immune and epithelial cells.

Conclusion:

Allergic rhinitis appears to predict response to mepoluzimab. While this association has been previously reported, the mechanistic underpinnings of this finding remain to be determined.

Transcriptomic analysis suggests that best response to mepoluzimab is in a pre-treatment environment with reduced immune signaling and preserved epithelial activity.

Poster #A120

WITHDRAWN

Poster #A121

Predictors of early postoperative complications following FESS

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Background:

Functional endoscopic sinus surgery (FESS) is commonly performed for treatment of chronic rhinosinusitis (CRS), yet contemporary large-scale data identifying patient-level predictors of early postoperative complications remain limited. We evaluated risk factors associated with the risk of nasal hemorrhage, orbital injury, and cerebrospinal fluid (CSF) leak within 30 days following FESS.

Methods:

A retrospective cohort study was conducted using the TriNetX Research Network. Patients with CRS undergoing FESS after January 1, 2015 were included. Patients with secondary CRS, sinonasal malignancy, coagulation disorders, or prior orbital injury were excluded.

POSTERS

Covariates were assessed within 1 year before surgery. Outcomes included nasal hemorrhage, orbital injury, and CSF leak. Cox regression with iterative variable selection ($p < 0.20$ screening; $p < 0.05$ final retention) was performed.

Results:

Among 70,184 patients, 2,605 (3.71%) experienced a complication. Nasal hemorrhage occurred in 2,006 (2.86%), orbital injury in 473 (0.67%), and CSF leak in 282 (0.40%). Nasal hemorrhage was most strongly associated with anticoagulant/antiplatelet use (HR 1.85, $p < 0.01$), atrial fibrillation (HR 1.63, $p < 0.01$), and heart failure (HR 1.49, $p < 0.01$). Orbital injury was most strongly associated with Black race (HR 1.84, $p < 0.01$), chronic kidney disease (HR 1.66, $p = 0.02$), and obesity (HR 1.44, $p = 0.03$). CSF leak was most strongly associated with Black race (HR 1.85, $p < 0.01$), nicotine dependence (HR 1.70, $p < 0.01$), and hypertension (HR 1.66, $p < 0.01$).

Conclusion:

Early complications following FESS are uncommon but associated with specific patient characteristics, supporting improved perioperative counseling and risk stratification.

Poster #A122

Predictors of Refractory CRS After FESS

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Background:

Refractory chronic rhinosinusitis (CRS) after functional endoscopic sinus surgery (FESS) has traditionally been defined by revision surgery alone. With the emergence of biologic therapies, treatment escalation now includes revision surgery and/or biologic initiation. We sought to identify independent predictors of refractory primary CRS using a composite outcome incorporating surgery and/or biologic initiation.

Methods:

Adult patients with primary CRS undergoing FESS after 2015 were identified in the TriNetX

Research Network. Patients with secondary CRS, prior biologic therapy, or sinonasal neoplasms were excluded. The primary outcome was refractory CRS, defined as revision FESS or biologic initiation from 3 months to 5 years postoperatively. Preoperative covariates were evaluated using Cox proportional hazards modeling with stepwise selection.

Results:

Among 24,759 patients, 2,866 (11.6%) had refractory CRS after FESS. Of these, 66.6% underwent revision FESS, 42.0% initiated biologic therapy, and 8.7% had revision surgery and initiated a biologic therapy. In multivariable analysis, asthma was the strongest predictor (HR 2.06, $p < 0.001$), followed by allergy to analgesic agents (e.g. NSAIDs) (HR 1.87, $p < 0.001$), nasal polyps (HR 1.67, $p < 0.001$), food allergy (HR 1.37, $p = 0.096$), COPD (HR 1.27, $p = 0.006$), eosinophilia (HR 1.27, $p < 0.001$), and Black or African American race (HR 1.16, $p = 0.044$).

Conclusion:

Refractory CRS following FESS is strongly associated with type 2 inflammatory comorbidities and select demographic factors. Incorporating biologic therapy into outcome definitions provides a contemporary framework for risk stratification and postoperative counseling.

Poster #A123

Prescribing practices of intranasal corticosteroids for chronic rhinosinusitis amongst United States

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Background:

Intranasal corticosteroids (INCS) are a cornerstone of medical management for chronic rhinosinusitis (CRS), with high-volume saline irrigation (HVS) increasingly used to enhance drug delivery. However, real-world prescribing practices among U.S. otolaryngologists remain incompletely characterized. We aimed to assess INCS prescribing practices via HVS.

POSTERS

Methods:

A 17-item questionnaire with multiple choice and written text answers was distributed to active attending physician members of the American Rhinologic Society (ARS). Data were analyzed descriptively.

Results:

Sixty-two responses were collected. All respondents reported prescribing INCS via HVSI. The most common medications prescribed for CRS were fluticasone (83.9%), mometasone (80.6%), and budesonide (62.9%). Key factors considered when prescribing included effectiveness (75.8%), cost to patients (72.6%), and insurance coverage (59.7%). Among respondents using budesonide in HVSI (90.3%), 0.5 mg/dose (77.4%) and twice daily (90.3%) were most common. Most respondents (72.6%) reported counseling patients, with discussions commonly focused on epistaxis, nasal dryness/crusting, and altered taste/smell. Only a minority (24.2%) of respondents reported long-term safety concerns.

Conclusions:

INCS via HVSI are widely utilized among surveyed U.S. otolaryngologists. Although variability exists in dosing and duration, prescribing patterns are broadly consistent, with predominant use of budesonide, twice-daily administration, and long-term or indefinite treatment. Prescribing reflects both clinical efficacy and access considerations. Low concern for long-term safety, alongside patient counseling, supports continued attention from otolaryngologists to potential risks.

Poster #A124

Prognostic implications of p16 and HPV discordance in sinonasal squamous cell carcinomas

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Background:

p16 immunohistochemistry serves as a surrogate marker for human papilloma virus (HPV) infection. Discordance between p16 and HPV-association has been observed in patients with oropharyngeal cancer and carries prognostic implications, however the role of p16

and HPV discordance in sinonasal squamous cell carcinoma (SCC) remains less well defined. We aimed to assess the prevalence of p16 expression and HPV-association in sinonasal SCC and its prognostic implications.

Methods:

We retrospectively analyzed 48 sinonasal SCC cases diagnosed at a single academic institution between 2019 and 2025. p16 status was determined by immunohistochemistry and HPV testing was performed in accordance with institution-specific protocols. Log-rank tests were performed across all biomarker subgroups.

Results:

Due to incomplete biomarker testing, p16 and HPV-status were assessed in 21 patients. Discordance between p16 and HPV-association status was observed in 6/21 cases (28.6%), with all 6 patients with p16+ and HPV-independent disease. There was no observed statistically significant difference in 5-year overall survival (OS) or disease-free survival (DFS) between patients between biomarker subgroups (OS $p=0.65$, DFS $p=0.38$), though a trend toward worse DFS was noted in the discordant group (0% vs. 75% at 5 years). p16+/HPV+ patients are significantly younger than p16+/HPV- patients.

Conclusion:

p16 may be limited as a surrogate marker for detecting HPV-associated sinonasal SCC. Larger cohort studies are needed to understand the impact of discordant sinonasal SCC on disease prognosis but seems to trend towards a worse prognosis. This exploratory analysis confirms the need for continued enrollment of additional patients into this study.

Poster #A125

Progress in biologic therapy for CRSwNP: A 3-year educational analysis

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Despite growing evidence supporting biologic efficacy in CRSwNP management, variability in clinical application persists. This study analyzes

POSTERS

educational program outcomes to assess how knowledge, comfort, and decision-making in biologic therapy have evolved among otolaryngologists (ENTs) and specialty advanced practice clinicians over time.

Data were collected from assessments at 7 live symposia targeting ENT clinicians, from 2024-26. Key areas included patient selection, treatment timing, and response monitoring. Over 3 years and 1,307 learners, significant improvements were observed in both foundational knowledge and clinical decision-making. Baseline knowledge of biologic eligibility increased from 53% in 2024 to >80% in 2026. Baseline comfort levels with escalating treatment to biologics for patients with severe or refractory CRSwNP reached 73% in 2026. Clinicians became more adept at using biomarkers and clinical features to select appropriate biologic treatments, with responses to case-based scenarios showing marked improvements. However, insights from open-ended comments revealed practical challenges and real-world concerns.

This analysis demonstrates that targeted educational interventions enhance clinicians' understanding and application of biologic therapies in CRSwNP management. Increasing confidence in using biologics earlier in treatment and adoption of biomarkers for patient selection reflect positive changes in clinical practice. Open-ended feedback reveals challenges, including ideal timing of therapy, handling partial responses, and addressing patient concerns. Continuous education and clear clinical pathways are necessary to ensure optimal use of biologics and to navigate real-world obstacles.

Poster #A126

Psammomatoid ossifying fibroma with skull base extension: Case report and literature review

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Introduction:

Expansile midline sinonasal masses with skull base extension present a broad differential, including malignancy, invasive fungal disease,

and granulomatous processes. Psammomatoid ossifying fibroma (PsOF) is a rare benign fibro-osseous lesion that can mimic aggressive pathology clinically and radiographically, particularly when intracranial extension is present.

Methods:

We describe a 54-year-old female with nasal obstruction, anosmia, and facial pressure from a large midline sinonasal mass with skull base and intracranial extension. A literature review using PubMed, EMBASE, and Web of Science showed reports of sinonasal PsOF, including presentation, imaging, histopathologic and immunohistochemical findings, and outcomes.

Results:

The patient underwent endoscopic gross total resection with Draf III frontal sinusotomy, cribriform resection, and fascia lata reconstruction. Pathology was consistent with PsOF, with immunohistochemical features also suggesting psammomatous meningioma. Postoperative imaging confirmed complete resection without recurrence. The literature supports PsOF as a locally aggressive entity with a recurrence rate of 30–56% following incomplete resection; gross total resection substantially reduces recurrence. Critically, PsOF and psammomatous meningioma share expression of EMA and vimentin, rendering immunohistochemistry insufficient for diagnosis and underscoring the primacy of histologic ossicle architecture in distinguishing these entities.

Conclusion:

PsOF should be included in the differential for expansile sinonasal masses with skull base involvement. Recognizing this rare entity and its histopathologic overlap with psammomatous meningioma is critical for surgical planning and surveillance.

POSTERS

Poster #A127

Psychological dysfunction and 5-year general health outcomes after endoscopic sinus surgery

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Background:

Psychological dysfunction is prevalent in chronic rhinosinusitis (CRS) and associated with worse disease-specific quality of life. Our objective was to assess the impact of psychological burden on general health-related quality of life (HRQoL) following endoscopic sinus surgery (ESS) through 5 years.

Methods:

CRS patients were prospectively enrolled and completed the 22-item sinonasal outcome test (SNOT-22) and EQ-5D Visual Analog Scale (VAS) and Health Utility Value (HUV) surveys preoperatively and postoperatively at 3 months, 1 year, and annually until 5 years. Patients were stratified by preoperative SNOT-22 psychological domain scores into high (HPD; n=694) and low (LPD; n=613) psychological dysfunction groups, and outcomes were compared.

Results:

Patients with HPD were significantly more likely to be male, have had prior ESS, smoke, and have comorbid allergy or headaches. Patients with HPD had significantly lower baseline VAS (66.4±17.8 vs. 79.1±14.5) and HUV (0.77±0.13 vs. 0.87±0.10; p<0.001) scores compared to those with LPD. Both groups demonstrated significant improvement postoperatively, with HPD patients achieving greater absolute gains (VAS: +9.4 vs. +3.9; HUV +0.086 vs. +0.050 at 1 year). However, HPD patients maintained significantly lower VAS and HUV through 5 years (p<0.001) compared to LPD patients. On multivariable analysis, HPD independently predicted lower VAS (β =-3.29, p=0.001) and HUV (β =-0.027, p<0.001).

Conclusions:

CRS patients with high preoperative psychological burden achieve meaningful HRQoL improvements after ESS, but maintain persistently lower general health through 5 years. Preoperative psychological burden

should be considered when counseling patients.

Poster #A128

Racial differences in pediatric allergic rhinitis diagnosis and management

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Introduction:

Allergic rhinitis (AR) is a common pediatric condition, and racial disparities may influence diagnosis and management. We studied whether rates in AR diagnosis, treatment, and allergy testing differ between Black and White children.

Methods:

We conducted a retrospective cohort study using the TriNetX Network. Pediatric patients (≤ 17 years) from 2015–2025 with ≥ 2 AR diagnoses (ICD-10 J30.9) during evaluation and management (E/M) encounters were stratified by race (Black vs White). A secondary E/M cohort assessed likelihood of AR diagnosis by race. Cohorts underwent 1:1 propensity score matching by sex, ethnicity (Hispanic or Latino), and comorbidities. Outcomes included medication use, allergy testing, sinusitis, and AR diagnosis.

Results:

Among 343,773 children with AR, Black children, compared to White children were more likely to use intranasal corticosteroids (60,301 [53.3%] vs 50,724 [44.8%]) and oral antihistamines (66,828 [59.0%] vs 46,322 [40.9%]) but less likely to use montelukast (17,506 [15.5%] vs 19,844 [17.5%]). Black children were also less likely to have allergy skin testing (4,873 [4.3%] vs 7,474 [6.6%]) and IgE testing (3,996 [3.5%] vs 6,075 [5.4%]) with lower rates of chronic sinusitis (3,164 [2.8%] vs 5,747 [5.1%]) and acute sinusitis (4,709 [4.2%] vs 6,876 [6.1%]). In the matched E/M cohort, 2,560,860 patients were included in each group. Black children had a higher likelihood of AR diagnosis compared to White children (191,708 [7.49%] vs 133,243 [5.20%]).

Conclusion:

Racial disparities in AR management were observed beyond diagnosis, including differences in testing and treatment patterns.

POSTERS

Standardized diagnostic protocols and equitable access to allergy evaluation may reduce these disparities.

Poster #A129

Real-world effectiveness of Dupilumab in CRSwNP

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Introduction:

Dupilumab is approved for treating chronic rhinosinusitis with nasal polyps (CRSwNP). Real-world evidence on dupilumab's effectiveness in US patients remains limited. This study evaluates its impact on oral corticosteroid (OCS) burden and CRSwNP-related outcomes.

Methods:

This retrospective analysis used the Inovalon Real World Data US administrative claims database to identify adult CRSwNP patients initiating dupilumab (June 2019–October 2023) with ≥1-year continuous insurance enrollment pre- and post-initiation. CRSwNP-related OCS fills and bursts, INCS fills, antibiotic fills, and exacerbations (CRSwNP- and asthma-related) were compared between 1-year pre- and post-initiation periods using incidence rate ratios (IRRs) estimated by Poisson regression with generalized estimating equations. Subgroup analyses assessed longitudinal effects in patients with ≥3 years follow-up and in those persistent on dupilumab.

Results:

A total of 4,482 patients initiating dupilumab were included (median age 48 years; 69.6% with comorbid asthma). After dupilumab initiation, CRSwNP-related OCS fills (76% reduction; IRR [95% CI] 0.24 [0.22, 0.26]) and OCS bursts (74%; 0.26 [0.24, 0.28]), INCS fills (30%; 0.70 [0.66, 0.75]), oral antibiotic fills (48%; 0.52 [0.50, 0.55]), CRSwNP

exacerbations (79%; 0.21 [0.19, 0.23]) and asthma exacerbations (63%; 0.37 [0.35, 0.39]) were significantly ($p < 0.01$) reduced. Consistent results were observed in the subgroup analysis.

Conclusion:

In this real-world study, dupilumab was associated with significant reduction in corticosteroid, antibiotic, and exacerbation burden. Limitations include residual confounding due to unmeasured disease severity; prospective studies are needed to confirm these findings.

Poster #A130

Real-world evaluation of polyp and symptom burden at time of biologic prescription for CRSwNP

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Introduction:

Real-world data from the US on polyp and symptom burden at the time of biologic prescription is limited. Additionally, commercial payors are more frequently implementing thresholds for polyp scores based on inclusion criteria from industry-sponsored trials rather than real-world clinical data. This study's goal was to describe polyp burden in a post-ESS population using the Postoperative Polyp Scale (POPS) which is more sensitive to polyp recurrence than the traditional Nasal Polyp Scale.

Methods:

A retrospective review of post-ESS patients from three institutions and six rhinologists who were prescribed biologics for CRSwNP was performed. POPS, NPS, and 22-Item Sinonasal Outcomes Test (SNOT-22) were evaluated and descriptive statistics were performed.

POSTERS

Results:

67 patients were included in the study; 97% were prescribed dupilimab. Mean SNOT-22 scores for patients at initiation of biologic therapy was 28.9 (IQR: 12-43). One-way ANOVA with post-hoc Tukey HSD Test comparing SNOT-22 subdomains demonstrated that the rhinologic subdomain score was significantly higher than the ear/facial ($p=0.03$) and psychological subdomains ($p=0.005$), and the extra-nasal rhinologic subdomain was significantly higher than the psychological subdomain ($p=0.01$). All other comparisons were not significant. Mean POPS 4.6+2.3 was significantly higher than mean NPS 3.3+1.7 ($p=0.01$).

Conclusion:

In a postoperative CRSwNP patient population, symptom burden at time of biologic prescription was highly variable, but rhinologic and extra-nasal rhinologic subdomain symptoms unsurprisingly were prominent. NPS was relatively low while POPS was moderate in severity, highlighting its potential for improved sensitivity in detecting polyp recurrence.

Poster #A131

Referral patterns and survival in sinonasal SCC

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Introduction:

Sinonasal squamous cell carcinoma (SNSCC) is a rare, complex malignancy in which outcomes may depend on access to specialized, high-volume care. However, referral patterns and their impact on survival are not well defined.

Methods:

Adult patients with SNSCC diagnosed between 2010 and 2022 were identified from the National Cancer Database. Referral was defined as treatment at a facility different from the diagnosing institution. Multivariable logistic regression identified predictors of referral. Overall survival (OS) was evaluated using Kaplan–Meier analysis and multivariable Cox proportional hazards models with clustering by facility.

Results:

Among 8,924 patients, 4,634 (51.9%) received referred care, increasing from 49.1% in 2010 to 54.4% in 2022. Referral was less likely among Black patients (OR 0.80, $p=0.008$), Medicaid-insured (OR 0.75, $p=0.001$), uninsured (OR 0.72, $p=0.016$), and those from lower-income areas (OR 0.77, $p=0.011$). Referral was more likely with greater travel distance (OR 2.02 for >100 miles, $p<0.001$) and at high-volume centers (OR 1.37, $p=0.004$). Referred patients more frequently underwent multimodality surgical treatment, including surgery with adjuvant radiation (27% vs 20%). Referral was independently associated with improved OS (HR 0.92, 95% CI 0.86–0.98, $p=0.014$), consistent across sensitivity analyses (HR 0.84–0.92). The survival benefit was greatest when surgery occurred at the reporting facility (HR 0.84, $p<0.001$).

Conclusion:

Referral for SNSCC is common, increasing, and associated with improved survival, likely reflecting access to specialized care. Persistent disparities in referral highlight the need to improve equitable access to high-volume sinonasal cancer centers.

Poster #A132

Reversible smell loss in allergic rhinitis: Clinical insights and therapeutic implications

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Background:

Odor is crucial for flavor, security, and overall well-being, and its absence can disrupt everyday activities. Allergic rhinitis often leads to olfactory impairment, but information regarding its prevalence, severity, and reversibility in Bangladesh is scarce. This study examines smell dysfunction in patients with allergic rhinitis and analyzes treatment results.

Methods:

A observational study took place at the ENT Outpatient Department of Cumilla Medical College and Hospital (October 2024–September 2025). Eighty individuals with allergic rhinitis were recruited. Olfactory performance was evaluated with a VAS (1–10) and categorized as mild, moderate, or severe. Patients who were affected were given intranasal corticosteroids and oral

POSTERS

antihistamines for four weeks, with results noted as complete, partial, or no recovery.

Results:

In a study involving 80 adults with allergic rhinitis (average age 34 ± 11 ; 55% female), 63.8% experienced seasonal rhinitis, while 47.5% reported symptoms lasting 1–5 years. Loss of smell happened in 56.3%, primarily moderate. Following four weeks of treatment, 80% showed improvement (37.8% fully, 42.2% partially; VAS 4.9 → 1.7). The highest persistent loss was found in individuals with symptoms lasting over 5 years (28.6%), though it was not statistically significant ($\chi^2 = 1.07$, $p = 0.585$).

Conclusion:

Loss of smell, primarily moderate, impacted more than half of patients with allergic rhinitis. Treatment enhanced 80% of cases, and prompt intervention can lessen lasting olfactory dysfunction.

Poster #A133

Revision rates following inferior turbinate reduction surgery

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Objectives:

To determine revision rates following inferior turbinate reduction at two tertiary centers and characterize the timing, techniques, and clinical context of revision procedures.

Methods:

A retrospective review identified patients undergoing inferior turbinate reduction at two institutions (January 2015–December 2022) via CPT codes 30801, 30802, 30130, 30140, and 30930 ($n=658$). Revision was any repeat procedure 1–144 months post-index. Demographics, technique, concurrent procedures, and time to revision were extracted.

Results:

33 patients (5.0%) required revision at a median of 42 months (IQR 18–67; range 2–110). Superficial ablation (CPT 30802) had the highest revision rate (11.8%); turbinectomy (CPT 30130) had 0%. Index techniques:

MAIT±outfracture (48.5%), SMR±MAIT±outfracture (30.3%), RFA/ablation (12.1%), outfracture alone (6.1%), and partial turbinectomy (3.0%).

RFA/ablation patients revised earliest (median 23 months) vs. MAIT±outfracture (34.5 months) and SMR-based (42.5 months).

At revision, 72.7% changed technique; RFA/ablation increased (12.1% to 30.3%), SMR decreased (30.3% to 6.1%), and office-based revision rose from 12.1% to 30.3%. Concurrent septoplasty and FESS occurred at index in 51.5% and 36.4%. Allergic rhinitis was numerically higher in revision patients (57.1% vs. 49.9%; $p=0.56$).

Conclusion:

Revision rate was 5.0% at a median of 42 months. Less tissue-destructive techniques were associated with earlier, more frequent revision. Most patients required a technique change, shifting toward less invasive, office-based approaches. These findings provide the first institutional data on revision rates and timing, with direct implications for patient counselling and technique selection.

Poster #A134

Rhinosinusitis in adults on immunomodulating therapies: A scoping review

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Introduction:

Immunomodulatory therapies, including tumor necrosis factor alpha (TNF- α) inhibitors and anti-CD20 agents such as rituximab, are often used for autoimmune, inflammatory, and neoplastic disorders. While infection risk is well recognized, their association with rhinosinusitis remains poorly characterized.

Goal:

To map the existing literature on immunomodulators and rhinosinusitis and to identify emerging clinical patterns.

Methods:

A scoping review was conducted according to the PRISMA-ScR guidelines. Studies that

POSTERS

reported sinonasal outcomes in patients receiving TNF- α inhibitors or anti-CD agents were included.

Results:

A total of 34 studies were included. The literature was limited to case reports and retrospective cohorts. Distinct patterns emerged between drug classes. TNF- α inhibitors were primarily associated with new-onset or severe rhinosinusitis, including opportunistic and invasive fungal infections, often without documented hypogammaglobulinemia. In contrast, anti-CD20 therapy was consistently linked to recurrent bacterial rhinosinusitis within a broader sinopulmonary infection phenotype, frequently accompanied by secondary hypogammaglobulinemia. Several studies reported improvement in infection burden following immunoglobulin replacement therapy. Definitions of rhinosinusitis and outcome reporting were highly heterogeneous across studies.

Conclusion:

Immunomodulator-associated rhinosinusitis appears to manifest as two distinct phenotypes: a TNF- α inhibitor related opportunistic infection pattern and an anti-CD20 associated antibody-deficiency phenotype. Prospective studies are needed to define incidence, risk stratification, and management strategies for sinonasal disease in this patient population.

Poster #A135

Rhinosinusitis in adults with autoimmune diseases: A scoping review

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Introduction:

Chronic rhinosinusitis (CRS) and autoimmune diseases share inflammatory pathways, yet the scope of their association across diverse autoimmune conditions remains incompletely characterized. This scoping review aimed to map the breadth of evidence examining relationships between autoimmune diseases and rhinosinusitis, including epidemiologic associations, mechanistic pathways, and clinical outcomes.

Methods:

Following PRISMA-ScR guidelines, we systematically searched electronic databases for studies examining associations between autoimmune disorders and CRS. Data were extracted on study design, autoimmune conditions, outcomes, and key findings.

Results:

Twenty-five studies were included, comprising different types of studies. Rheumatoid arthritis demonstrated the most consistent association with CRS (OR 1.39–1.9). Sjögren's syndrome showed elevated CRS risk (HR 1.70–2.51), while SLE and ankylosing spondylitis demonstrated moderate associations. IgG4-related disease emerged as a distinct CRS phenotype with 32–59% sinonasal involvement responding to immunosuppression. Mendelian randomization studies identified causal relationships between multiple sclerosis, type 1 diabetes, celiac disease, hypothyroidism and CRS, mediated by IL-10, CXCL10, and CD6. CRSsNP showed stronger autoimmune associations than CRSwNP. Autoimmune disease was associated with worse quality of life and more frequent acute exacerbations.

Conclusion:

Substantial evidence supports associations between multiple autoimmune disorders and rhinosinusitis through shared Th1/Th17 pathways and mucosal immune dysregulation. Future research should focus on prospective phenotyping, biomarker integration, and targeted screening strategies.

Poster #A136

Risk of endoscopic sinus surgery post-solid organ transplantation

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Chronic rhinosinusitis (CRS) patients who undergo solid organ transplantation are at a higher risk of medically recalcitrant disease. We compared solid-organ recipients with pre-existing CRS who did and did not receive ESS post-transplant.

POSTERS

The TriNetx research platform was used to identify patients with a pre-transplant diagnosis of CRS who received a kidney, liver, lung, or heart transplant between the years 2006-2026. Patients were stratified by need for post-transplant ESS. Baseline characteristics were compared with Pearson's chi-squared test or independent samples t-test. Risk of ESS within 5 years was evaluated with a cox proportional hazards regression.

17,589 patients with CRS and solid organ transplant were identified; 751 had ESS post-transplant. Patients who had ESS were younger (55.8 ± 17.9 vs. 59.3 ± 17.1 , $p < 0.01$) and more likely to be white (76% vs 66%, $p < 0.01$). ESS patients more commonly had a pre-transplant diagnosis of asthma (31% vs. 24%), COPD (31% vs. 24%), acute sinusitis (60% vs. 33%), allergic rhinitis (45% vs. 34%), nasal polyp (40% vs 5%), sleep apnea (38% vs. 33%), diabetes (72% vs. 63%), and cystic fibrosis (28% vs 7%; all $p < .01$). Patients with history of asthma (HR 2.17, CI 1.0, 4.6, $p = 0.04$), acute sinusitis (HR 2.24, CI 1.3, 3.9, $p < 0.01$), and nasal polyps (HR 3.38, CI 1.4, 8.4, $p < 0.01$) pre-transplant had a significantly higher risk of ESS. Other baseline conditions were non-significant. Pre-transplant methotrexate was linked with increased need (HR 3.66, CI 1.1, 12.0, $p = 0.03$). History of nicotine dependence was associated with lower risk (HR 0.46, CI 0.2, 0.9, $p = 0.04$).

Patients with CRS who receive solid organ transplants have increased risk of needing ESS when pre-transplant airway disease is present.

Poster #A137

Safety and efficacy of a novel radiofrequency device for submucosal turbinate reduction

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Objective:

Inferior turbinate hypertrophy (ITH) is a major cause of nasal obstruction. Although surgical intervention is effective, it can be associated with morbidity and prolonged recovery. This study evaluated the safety, efficacy, and tolerability of a novel submucosal fractional radiofrequency (FRF) treatment.

Methods:

A prospective, single-arm, open-label study. Patients with nasal obstruction caused by ITH unresponsive to medical treatment were included in the study. The procedure was performed endoscopically under topical anesthesia using FRF. Outcomes were assessed using the Nasal Obstruction Symptom Evaluation (NOSE) scale, Visual Analog Scale (VAS), and endoscopic turbinate grading at baseline, one month, and three months after the procedure. The safety outcomes included pain scale, adverse events, and complications.

Results:

A total of 22 patients completed the protocol. The NOSE score improved from 71.2 to 30.0 at one month ($p < 0.001$). Sustained NOSE score improvement was observed at three months (37.1, $p < 0.001$). The VAS scores for nasal obstruction decreased from 7.4 to 3.2 at one month and 3.9 at three months ($p < 0.0001$). Endoscopic grading of turbinate size demonstrated a reduction at both follow-up points ($p < 0.05$). The average VAS score for pain was 3.4. No bleeding, synechiae, or other adverse events were reported. Crusting appeared in 50% of patients at one month, resolving in all but one patient by three months.

Conclusion:

Submucosal FRF treatment leads to significant and sustained improvement in nasal obstruction with minimal pain and no major adverse events. These results support the safety, efficacy, and tolerability of the procedure for ITH hypertrophy in an outpatient setting.

Poster #A138

WITHDRAWN

Poster #A139

Septoplasty reimbursement in California

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POSTERS

Introduction:

Geographic variation in Medicare reimbursement may be exacerbated when payments are not aligned with local cost of living, which can put burdens on patients and providers in high-cost regions. We evaluated how Medicare reimbursement for CPT 30520 (septoplasty) varies across California counties after adjusting for regional cost-of-living indexes (COLI).

Methods:

Medicare Physician Fee Schedule data from 2023 - 2025 for CPT 30520 using all facility localities listed under California were utilized. For each locality we calculated a COLI-adjusted reimbursement ($100 \times \text{facility price}/\text{COLI}$). We compared these values to the statewide mean and reported p-values as descriptive measures of deviation from the statewide average.

Results:

In 2025, COLI-adjusted mean reimbursement for CPT 30520 ranged from 0.402 to 0.725 across all California localities (statewide mean 0.584). Inland Central Valley and desert localities demonstrated large, statistically significant surpluses. Coastal and Bay Area localities exhibited substantial deficits, including Marin (0.402, -0.182, $p < 0.001$), Santa Clara (0.409, -0.175, $p < 0.001$), Santa Cruz (0.413, -0.171, $p < 0.001$), and the San Francisco/Alameda/Contra Costa/San Mateo grouping (0.428, -0.156, $p < 0.001$). Los Angeles/Orange county grouping had a moderate deficit (-0.037, $p < 0.01$), along with San Diego county (-0.073, $p < 0.01$). Similar patterns were observed in both 2023 and 2024.

Conclusion:

After adjusting for cost of living, Medicare reimbursement for CPT 30520 is predominantly higher in lower-cost California regions and lower in coastal and bay area markets. These findings suggest potential implications for access to otolaryngologic care based on county.

Poster #A140

Serous versus mucinous submucosal gland density in chronic nonallergic or mixed rhinitis

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Background:

Non-allergic rhinitis (NAR) is a common but poorly understood condition, with clear thin rhinorrhea (CTR) being a prominent symptom. While CTR is presumably due to a predominance of serous secretion, the distribution of serous and mucinous glands in the nasal mucosa has not been well-characterized. This study aimed to calculate glandular composition in NAR patients' nasal mucosa.

Methods:

Middle turbinate mucosal samples were obtained from 19 patients (10 chronic rhinitis (CR), 9 controls). CR patients were NAR or mixed rhinitis (AR excluded); they underwent endoscopic extended posterior nasal neurectomy for predominantly clear thin rhinorrhea. Controls were skull base surgery patients without CR. Specimens were formalin-fixed, sectioned, and H&E stained. Digitized slides were analyzed, and glands were annotated as serous or mucinous. Serous-to-mucinous gland ratios were calculated. Group comparisons were performed using the Wilcoxon rank-sum test, with Hodges-Lehmann estimates and bootstrap confidence intervals.

Results:

Of 10 CR patients (70% were NAR, 30% mixed). Median serous-to-mucinous gland ratio was significantly higher in NAR compared to controls (5.1 versus 2.2, $p=0.035$). The Hodges-Lehmann estimate demonstrated a location shift of 2.7 (95% CI 0.08–14.20). The unadjusted geometric mean ratio was 3.1 (95% CI 1.38–7.32).

Conclusions:

Patients with NAR or mixed rhinitis and prominent clear rhinorrhea demonstrated a roughly 3-fold increase in serous submucosal glands within middle turbinate mucosa compared to controls. More research is needed to understand the mechanisms behind the

POSTERS

increased presence of serous submucosal glands and the pathophysiological and therapeutic significance.

Poster #A141

Severe complications after neoadjuvant ipilimumab/nivolumab for sinonasal mucosal melanoma

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Neoadjuvant immunotherapy for mucosal melanoma is promising, but perioperative safety data remain limited. We report a case with a complicated postoperative course after neoadjuvant ipilimumab/nivolumab for locally advanced sinonasal mucosal melanoma and review the relevant literature. A 53-year-old man with cT4bN0M0 mucosal melanoma of the right maxillary sinus received 3 cycles of neoadjuvant ipilimumab/nivolumab with radiographic response, but treatment was complicated by immune-related hepatitis and colitis. On 8/18/2025, he underwent endoscopic resection of the anterior cranial base and dura, with reconstruction using dural allograft, left inferior turbinate flap, and fascia lata graft. Margins were negative. On 9/3/2025, he presented with pneumococcal meningitis despite no clinical evidence of CSF leak. Several days later, he developed encephalocele and CSF leak, requiring endoscopic revision, followed by bicoronal craniotomy with pericranial flap repair. His course was further complicated by HIT with bilateral upper-extremity DVTs and bicoronal wound infection with epidural abscess requiring washout/craniectomy; cultures grew *Candida albicans*. He later completed adjuvant radiation, and in March 2026 had no evidence of disease. Available neoadjuvant mucosal melanoma series report pathologic response rates of approximately 33%–38%, but dual checkpoint blockade carries risk of substantial severe toxicity, and emerging perioperative literature suggests a possible association with heightened wound complications. Although causality cannot be established, this case highlights the need for heightened perioperative vigilance and further study of skull base healing and reconstructive outcomes after neoadjuvant checkpoint blockade.

Poster #A142

Single institution evaluation of CSF leaks in non-pituitary suprasellar, ACF, and PCF pathology

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Understanding etiologies of cerebrospinal fluid (CSF) leaks following extended skull base surgery (ESBS) may guide management. This is a retrospective review of patients with endoscopic ESBS for either non-pituitary suprasellar, anterior cranial fossa (ACF), and posterior cranial fossa (PCF) pathology with postoperative CSF leak. Outcomes included leak timing, leak management leak, placement of drain and duration, intraoperative takeback findings, leak reconstruction, and development of meningitis. From 2015-2025, 869 patients had surgery, with 31/243 suprasellar leaks (12.75%), 11/176 ACF (6.25%), and 53/450 PCF (11.78%). Drain placement at initial surgery was 23.5% for suprasellar, 79.2% for PCF, and 90.0% for ACF ($p < 0.001$). Duration of time between incident surgery and leak was longest for PCF at 4.9 days (suprasellar 3.5, ACF 3; $p = 0.04$). All leaks were treated with surgery. Lumbar drain placement at revision was most common in PCF defects (92%; suprasellar, 79%; ACF, 73%; $p < 0.001$). Etiologies of reconstruction failure varied: flap dehiscence was the most frequent finding, suprasellar $n = 22$, ACF $n = 5$, PCF $n = 28$ ($p = 0.01$). Reconstruction displacement was seen more in suprasellar group ($n = 11$, ACF $n = 3$, PCF $n = 9$), while flap necrosis was seen most in PCF ($n = 19$; ACF $n = 1$; suprasellar $n = 3$). Salvage flaps were used for 26.4% PCF and 27.3% ACF (11.8% suprasellar); pericranial salvage flap was most commonly used for PCF ($p = 0.03$). Meningitis occurred in 54.7% of PCF patients (suprasellar 14.7%, ACF 9.1%; $p < 0.001$). CSF leak timing and etiology vary by location, with flap necrosis and meningitis more observed in PCF defects. Recognition of location-specific failure patterns may inform reconstruction strategies and management.

POSTERS

Poster #A143

Sinonasal adenosquamous carcinoma: Experience and treatment outcomes

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Background:

Sinonasal adenosquamous carcinoma (SNAsqC) is a rare subtype of squamous cell carcinoma characterized by both squamous and glandular differentiation. Although adenosquamous carcinoma is considered more aggressive than conventional SCC, its behavior in the sinonasal tract remains poorly investigated, particularly in the context of human papillomavirus (HPV).

Methods:

A retrospective cohort study, conducted at a tertiary referral center. Electronic medical records were reviewed to identify pathologically confirmed SNAsqC. Clinical presentation, imaging, pathology, management, and outcomes were recorded.

Results:

Nineteen patients were identified (mean age 52.0 ± 17.9 years); 14 (73.7%) were male, and 11 (57.9%) had a smoking history. Three patients (15.8%) presented with recurrence after treatment elsewhere. Advanced local disease was common: orbital invasion in 6 (31.6%), skull base invasion in 7 (36.8%), pterygopalatine fossa invasion in 5 (26.3%), and intracranial extension in 3 (15.8%). One patient (5.3%) had nodal disease. HPV association was identified in 8 patients (42.1%). Thirteen patients underwent surgery (6 endoscopic, 4 open, 3 combined). Perineural and lymphovascular invasion were present in 2 (10.5%) and 3 (15.8%), respectively. Adjuvant radiation was given to 13 (68.4%) and chemotherapy to 8 (42.1%). Local recurrence occurred in 3 patients (15.8%), with no regional or distant metastases. At a mean follow-up of 14.2 ± 3.3 years, 11/18 (61.1%) were alive without evidence of disease. Among HPV-associated cases, 6/8 remained disease-free.

Conclusion:

SNAsqC is frequently HPV-associated and

often presents with locally advanced disease. Long-term disease control can be achieved with multidisciplinary management.

Poster #A144

Sinonasal and skull base manifestations of IgG4-related disease: A case series and literature review

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Background:

Immunoglobulin G4-related disease (IgG4-RD) is a chronic fibroinflammatory condition that can affect multiple organs, including the sinonasal tract and skull base. These presentations are rare and may mimic neoplastic or infectious processes, posing diagnostic challenges.

Objective:

To describe the clinical, radiological, and histopathological features of patients with sinonasal and skull base involvement by IgG4-RD, and to review the current literature.

Methods:

We conducted a retrospective analysis of patients diagnosed with IgG4-RD involving the sinonasal tract and skull base. Clinical presentation, imaging findings, histopathological characteristics, and treatment outcomes were reviewed. A literature review was also performed.

Results:

Six patients were included, predominantly female, with a wide age range. Common symptoms included headache, facial pain, nasal obstruction, and cranial neuropathies. Imaging frequently demonstrated infiltrative or mass-like lesions with bone erosion and dural involvement. Histopathological analysis revealed lymphoplasmacytic infiltrate, varying degrees of fibrosis, and increased IgG4-positive plasma cells, with IgG4/IgG ratios supporting the diagnosis. Treatment strategies included corticosteroids, immunosuppressive agents, rituximab, and surgical intervention in selected cases. Clinical improvement was observed in most patients.

POSTERS

Conclusion:

IgG4-RD involving the sinonasal tract and skull base is an uncommon but important differential diagnosis for infiltrative lesions in this region. Recognition of its characteristic features is essential to avoid misdiagnosis and to guide appropriate management.

Poster #A145

Sinonasal outcomes after endoscopic endonasal orbital decompression for thyroid eye disease

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Introduction:

Surgical management of thyroid eye disease (TED) includes medial and lateral orbital decompression (OD). However, the sinonasal impact of endoscopic endonasal OD remains incompletely characterized.

Objective:

To evaluate subjective and objective sinonasal outcomes following endoscopic endonasal orbital decompression for TED.

Methods:

A retrospective cohort study was conducted including all patients who underwent orbital decompression for TED. Patient demographics, comorbidities, endoscopic findings, and SNOT-22 scores were collected preoperatively and at each postoperative follow-up. The endoscopic endonasal OD technique included middle meatal antrostomy, total ethmoidectomy, and partial middle turbinate resection, with frontal sinusotomy and septoplasty performed when indicated.

Results:

Thirty-five patients underwent 60 orbital decompression procedures (25 bilateral, 10 unilateral). Mean age was 52.9 ± 14.2 years, and 71.4% were female. Active smoking was present in 37.1% of patients, 51.4% were former smokers, 20% had allergic rhinitis, 20% had asthma, and none had a prior history of chronic rhinosinusitis. Mean follow-up was 5.3 ± 4.4 months. Postoperatively, there was no significant change in total SNOT-22 scores (24.4 vs 22.1 , $p = 0.297$) or in the rhinologic,

extrarhinologic, ear/facial, or sleep domains. In contrast, a significant improvement was observed in the psychological domain (11.4 vs 8.3 , $p = 0.006$). Only two patients (3.3%) developed postoperative frontal sinusitis requiring surgical frontal sinusotomy.

Conclusion:

Endoscopic endonasal orbital decompression for TED does not negatively impact sinonasal quality of life and is associated with a low risk of clinically significant iatrogenic sinusitis.

Poster #A146

Sinusitis after zygomatic implants: Radiographic findings and outcomes

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Background:

Zygomatic implantation (ZI) is associated with high implant survival rates, but carries a recognized risk of sinusitis. An international consensus statement reported a pooled sinusitis prevalence of 14.2%. At our institution, frequent postoperative sinonasal complications prompted further investigation. Improved characterization of sinusitis risk may enhance preoperative risk stratification in patients undergoing ZI.

Methods:

A retrospective cohort study was conducted including 37 patients who underwent ZI at our institution. Complete clinical and radiographic data were available for 22 patients. Variables collected included pre- and postoperative sinusitis, presence of septal deviation, computed tomography (CT)-based Lund-Mackay scores (LMS), and implant survival.

Results:

Mean age was 61 years (range, 18–83). Preoperative sinusitis was identified in 3 of 22 patients (14%) with available data; all underwent concurrent sinus surgery, and none developed postoperative sinusitis. Among 18 patients with postoperative CT imaging, 12 (67%) demonstrated radiographic mucosal

POSTERS

thickening or opacification (LMS>0), with a mean postoperative LMS of 2.8. Among 11 patients with serial imaging, radiographic opacification resolved in 8 (73%) at final follow-up. Postoperative sinusitis occurred in 9 of 37 patients (24%), 5 underwent FESS for management of residual disease.

Conclusion:

The observed postoperative sinusitis rate of 24% exceeds previously reported estimates, and radiographic opacification in 67% of patients suggests subclinical sinonasal burden is underrecognized following ZI. These findings support routine preoperative rhinologic evaluation and multidisciplinary OMFS-ENT management.

Poster #A147

SNOT-22 changes during AECRS

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Background:

Acute exacerbations of chronic rhinosinusitis (AECRS) are defined as a transient worsening of sinonasal symptoms which have an impact either on the function or quality-of-life of a patient lasting longer than 3 days. How this transient increase translates into a change in validated patient reported outcome measured by the 22-item Sinonasal Outcome Test (SNOT-22) is unknown.

Objective:

The objective is to understand the quantitative change in the SNOT-22 relative to baseline during an AECRS.

Methods:

A cohort of CRS patients were recruited and demographic data and clinical characteristics were recorded. Participants were prospectively followed and a SNOT-22 score was recorded during an AECRS and at follow-up once disease was back to baseline. A linear mixed-effects model was used for data analysis.

Results:

Of the 72 patients who experienced AECRS, mean age was 51.6 years (80.6% female, 19.4% male). Within the cohort, 31.9% had nasal polyps, 79.1% had co-morbid allergic

rhinitis, 54.1% had comorbid asthma, and 69.4% had a history of prior endoscopic sinus surgery. Mean SNOT-22 scores increased significantly from 40.2 (95% CI 35.3–45.2) at baseline to 52.0 (95% CI 46.6–57.4) during AECRS (mean increase 11.8 points, 95% CI 6.44–17.1, n=77 events across 72 patients, p<0.001). This mean interval increase in the SNOT-22 reaches the minimal clinically important difference (MCID) of 12.

Conclusion:

SNOT-22 is noted to be reflective of quality-of-life detriment during AECRS further validating the impact that AECRS has on CRS patients.

Poster #A148

Socioeconomic factors and biologic use in CRSwNP

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Background:

Biologics have become widely utilized for multiple atopic diseases including chronic rhinosinusitis with nasal polyps (CRSwNP), but incur substantial costs. We aim to identify if insurance status and socioeconomic factors influence the use of biologic medications.

Methods:

Patients with CRSwNP on biologics at single institution from 2015 to 2025 were included. Data was collected on demographics, disease characteristics, type and duration of biologic use, and insurance status. Socioeconomic variables were obtained from the Area Deprivation Index (ADI) database using patient zip code. Independent sample t-tests and Fischer exact tests were used for statistical analysis.

Results:

35 patients on biologic therapy were identified, with 15 (42.8%) male and 20 (57.1%) female patients with a mean age of 49.7. Participants were divided into those who experienced interruptions in biologic therapy (n=18, 51.4%) versus those who had uninterrupted therapy

POSTERS

(n=17, 48.6%). Median household income and ADI scores between groups displayed no significant difference, although patients who experienced interruptions had lower median household incomes (\$84,783 vs \$95,179, $p=0.372$) and a higher ADI (4.11 vs 3.53, $p=0.454$). Patients with interrupted biologic use were significantly more likely to experience financial barriers obtaining the medication compared to those with uninterrupted use (44.4% vs 0%, $p<0.001$).

Conclusion:

Interrupted biologic use in CRSwNP patients is associated with insurance barriers that may prevent adherence. Avoiding interruptions in biologic therapy may minimize the therapeutic and cognitive burden placed on patients through repeat clinic visits and insurance care coordination.

Poster #A149

Socioeconomic factors and dental access in odontogenic sinusitis

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Background:

Odontogenic sinusitis (ODS) is an underrecognized yet clinically significant complication of dental infection, resulting from contiguous bacterial spread into the maxillary sinus. Poor dental hygiene, inconsistent follow-up, and dental procedures are recognized risk factors; however, the role of socioeconomic status remains poorly characterized. This study evaluates neighborhood deprivation and dental access in an ODS cohort using validated metrics.

Methods:

A retrospective case series of 74 patients with odontogenic infections was conducted. Area Deprivation Index (ADI) scores were obtained via the Neighborhood Atlas (9-digit zip codes). Dental provider density was determined using the NPPES NPI Registry (5-digit zip codes).

Kruskal-Wallis and Spearman rank tests assessed group differences and correlation.

Results:

Mean ADI was 11.7 (SD=12.3); mean dentists per zip code was 9.82 (SD=11.9). The cohort was 59.5% male and 60.8% white. Most patients (94.6%) had ODS; common etiologies included dental procedures (59.5%) and pulpal/root infection (20.3%). African American patients trended toward higher ADI (14.7 vs. 9.89, $p=0.092$) and fewer dentists per zip code (4.5 vs. 11.1, $p=0.183$) compared to white patients, although neither reached significance. No significant differences in ADI or provider density were found across clinical features, diagnoses, or etiologies. ADI and dentist density were uncorrelated ($r=-0.068$).

Conclusion:

No significant association was identified between neighborhood deprivation, dental provider accessibility, and ODS clinical features. Racial trends warrant further investigation. Future studies should compare ODS patients to unaffected populations to characterize disparities in access-to-care.

Poster #A150

Stretcher utilization as a modifiable driver of surgical turnover time in sinonasal surgery

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Introduction:

Functional endoscopic sinus surgery (FESS) and septoplasty rank among the most commonly performed otolaryngologic procedures in the United States, with approximately 257,000 and 260,000 cases performed annually, respectively. OR turnover is estimated at \$37–38 per minute, translating to \$1,100–2,600 per turnover episode in direct and indirect expenses.

Objectives:

To evaluate the effect of stretcher- versus operative table-based positioning on OR turnover time in patients undergoing FESS or septoplasty.

POSTERS

Methods:

A retrospective cohort study was conducted at a single tertiary care center. OR turnover time was defined as the interval between the out-of-room event of the preceding case and the in-room event of the subsequent case for a single surgeon. In February 2025, standard of care was transitioned to stretcher-based surgery. Cases were included from June 1, 2024, through April 1, 2026. Secondary outcomes included 30-day emergency department visits, 30-day readmissions, and unplanned return to the OR. Comparisons were performed using Welch's t-tests and multivariate linear regression.

Results:

A total of 373 patients were included (52.7% male; median age 44 years, IQR 33–62); 62% underwent surgery on an operative table and 38% on a stretcher. Stretcher use was associated with a significant five-minute reduction in OR turnover time ($p < 0.001$), with no differences in operative time or 30-day readmission rates.

Conclusion:

Stretcher-based FESS and septoplasty is associated with a clinically meaningful reduction in OR turnover time without compromising safety. This low-cost, modifiable approach may improve OR throughput and reduce perioperative expenditure in high-volume sinonasal practices.

Poster #A151

Surgical extent and post-op surveillance in invasive fungal sinusitis

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Invasive fungal sinusitis (IFS) is a rare, life-threatening infection with a mortality rate of at least 50%. To evaluate the relationship between initial surgical extent, post-operative surveillance strategies, and outcomes, we completed retrospective analysis of 54 IFS patients. Surgical extent was scored based on anatomical sites addressed at first operation and stratified into tertiles (low ≤ 3 , mid 4-5, high

≥ 6). Surveillance variables included planned follow-up, imaging surveillance, and total surveillance methods. Overall mortality was 64.8%. Tertile analysis of first-operation surgical extent revealed a significant non-linear relationship with mortality ($\chi^2 p = 0.047$): low extent, had 46% mortality, mid-extent had 88% mortality, and high-extent had 69% mortality. Planned FU was significantly associated with higher number of surgical interventions (2.0 vs 1.0, $p = 0.035$) but didn't independently predict mortality ($p = 0.572$). Surveillance intensity correlated with pathological disease extent ($r = 0.489$, $p < 0.001$) and differed by disease bilaterality ($p = 0.011$). Imaging surveillance alone did not predict mortality ($p = 0.538$). Disease resolution trended toward requiring more surgical procedures ($p = 0.053$). Among deceased patients, those who received ≥ 3 surgeries had median survival of 203-732 days vs. 61 days for single-surgery patients, reflecting survivorship bias. Moderate initial surgical extent identifies a high-risk cohort with 88% mortality, which may reflect disease too advanced for local control but not requiring radical resection. Planned post-op surveillance was associated with increased re-intervention but not improved survival; this may indicate that surveillance allows detection rather than changing disease trajectory.

Poster #A152

Surgical extent scoring in endoscopic sinus surgery: A scoping review

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Background:

Endoscopic sinus surgery (ESS) varies substantially in the extent of surgical dissection performed, even when described under the same procedural label. In chronic rhinosinusitis, this heterogeneity influences postoperative outcomes, revision rates and response to biologic therapies. No standardized framework exists to quantify surgical extent. This review aimed to identify and characterize available instruments.

POSTERS

Methods:

Scoping review following PRISMA-ScR guidelines with systematic search of PubMed/MEDLINE, Scopus, and Web of Science.

Results:

Twenty-one studies describing eleven instruments were included, spanning CT-based scores (ACCESS, CoSI, SSCS, REC Score), intraoperative classifications (LOEM, Complete vs Targeted, JRS), radiologic-surgical concordance metrics, and study-specific tools. CT-based instruments primarily assess surgical completeness, whereas intraoperative classifications capture surgical extent. CoSI demonstrated the most consistent outcome associations, with incomplete prior surgery predicting greater benefit from revision ESS. ACCESS showed preliminary utility in biologic response prediction. LOEM is the only intraoperative system with reported outcome associations, although evidence is limited to a single group. Evidence across instruments remains predominantly retrospective.

Conclusions:

Instruments differ in data source and conceptual approach. Structured scoring consistently reveals that many patients meeting guideline criteria for prior surgery have incomplete anatomical dissection. Given the association between surgical extent, outcomes, and biologic therapy response, standardized assessment warrants integration into clinical decision-making. Prospective validation is urgently needed.

Poster #A153

Survey on epistaxis after posterior nasal nerve ablation

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Introduction:

Posterior nasal nerve (PNN) ablation is an emerging procedure for chronic rhinitis. Early literature describes the procedure as effective and low risk, but recent studies identify delayed postoperative epistaxis as a notable complication. Data on epistaxis incidence remains limited, and counseling practices may not reflect its significance. This study surveyed practicing otolaryngologists to investigate the

frequency of delayed epistaxis and patient counseling practices.

Materials and Methods:

An anonymous survey was developed to characterize perceived incidence, severity, and management of delayed epistaxis after PNN ablation and the content of preprocedural counseling discussions. The survey was distributed to members of the American Rhinologic Society.

Results:

75 respondents completed the survey. Respondents performed an annual volume of 20–30 PNN ablations. 30.7% (n=23) had encountered delayed epistaxis after ablation. Of these, 21 estimated an event incidence of 0-5%, and two reported 5-10%. Events were reported on average 1-2 weeks post-procedure. 74.7% (n=56) counsel all patients on delayed epistaxis risk, 14.7% (n=11) counsel only those with risk factors, and 10.7% (n=8) do not counsel on this complication. Reported counseling practices varied widely, ranging from “mild expected post-op bleeding” to “potentially life-threatening bleeding.”

Conclusions:

Delayed epistaxis after PNN ablation appears to occur more often than previously recognized. 30% of respondents report at least one such case. Counseling practices varied widely, with some omitting discussion entirely. These findings highlight a gap in consensus on risk communication and suggest a need for standardized counseling guidelines for PNN ablation.

Poster #A154

SVI influence on CRS severity

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Objective:

The influence of social determinants of health (SDOH) on chronic rhinosinusitis (CRS) is understudied. Unlike other SDOH variables, the

POSTERS

social vulnerability index (SVI) incorporates household composition, disability, and minority/language factors. We evaluated whether SVI impact on baseline disease burden and 6-month treatment outcomes in CRS.

Methods:

In a prospective, multi-institutional cohort, 634 adults with CRS self-selected endoscopic sinus surgery (ESS; n=460) or continued appropriate medical therapy (CAMT; n=174). Baseline and 6-month measures included were collected, and SVI was assigned by zip code. Multivariable regression adjusted for relevant covariates.

Results:

The cohort had a mean SVI of 0.69 (SD, 0.19; range, 0.0938–0.9972). Higher SVI was associated with worse baseline SNOT-22 (B=14.00, p=0.001) and SF-6D (B=-0.125, p<0.001), after controlling for age, sex, nasal polyposis, allergy, asthma, prior surgery, CT score, and treatment choice. SVI was not associated with SNOT-22 change (B=8.05, p=0.086), SF-6D change (B=-0.039, p=0.219), or SNOT-22 MCID achievement (OR=0.45, p=0.300).

Conclusions:

SVI significantly influences baseline CRS severity and health utility, in addition to the effect of previously established clinical predictors but does not appear to impact treatment response. SVI captures functional social barriers to CRS care in a novel way compared with previously studied SDOH measures including area deprivation index. Further work is needed to balance classical homogenous patient cohorts by studying more diverse vulnerable populations in order to understand which SDOH factors are modifiable.

Poster #A155

Symptom characteristics in GERD and sinonasal complaints

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Introduction:

Gastroesophageal reflux disease (GERD) often reaches the nasopharynx and leads to various and frequent sinonasal complaints. GERD's implication in chronic rhinosinusitis (CRS)-related symptoms can confound a clinician's

assessment in patients presenting with sinonasal complaints. This study aims to characterize and compare the symptom severity profiles of patients with GERD compared to patients with CRS.

Methods:

Retrospective cross-sectional study of patients with GERD presenting for sinonasal complaints and patients with CRS was performed. GERD Patients who have CRS simultaneously were excluded. Consensus definitions were used to make the diagnoses of each group. Clinical characteristics, overall SNOT-22 and subdomain scores, and modified Lund-Kenedy (MLK) endoscopy scores were compared between the two cohorts.

Results:

GERD patients (n=148) compared to CRS patients (n=1,033) were about 5 years older (p=.002) and had lower MLK scores (diff=-2.83, p<.001) but were similar in sex, BMI, septal deviation, obstructive sleep apnea, asthma, and allergic rhinitis (p>.05). After controlling for covariates, GERD patients compared to CRS patients had lower scores for overall SNOT-22 (diff=-4.10, p=.022), rhinologic subdomain (diff=-2.46, p<.001), and runny nose (diff=-0.48, p<.001), but higher scores for post-nasal discharge (PND) (diff=0.65, p<.001) and cough (diff=0.44, p=.001), and similar thick nasal drainage scores (diff=-0.25, p=.096).

Conclusion:

When presenting for sinonasal complaints, patients with GERD have worse PND and cough symptoms but better rhinologic domain scores compared to CRS patients.

Poster #A156

Targeted review on disease burden in AFRS

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Background:

Allergic fungal rhinosinusitis (AFRS) is a subset of chronic rhinosinusitis characterized by a type 2 inflammatory response to fungi. Current understanding of AFRS burden is limited due to

POSTERS

its heterogeneous diagnostic criteria and geographic variability, hindering optimal patient management.

Methods:

We conducted a targeted literature review (MEDLINE and Embase) from 2012 to January 8, 2026, supplemented by congress proceedings. Studies examining AFRS epidemiology, clinical burden, humanistic impact, and treatment patterns were included.

Results:

Of 1,011 citations, 65 publications were included: 57 real-world studies (United States [US], n=14) and 8 guidelines/expert consensus. AFRS prevalence varied by climate and geography, with higher rates in the southeastern US. Common comorbidities included asthma (11–73%), allergic rhinitis (42–88%), and diabetes (7–20%). Complications included bone erosion (19–100%), nasal obstruction (20–92%), and orbital involvement (7–40%). Quality of life (QoL) was severely impacted, with mean preoperative SNOT-22 scores of 50–54. Treatment patterns indicated a high rate of endoscopic sinus surgery. Recurrence rates varied significantly (8–55%), necessitating revision surgery in 16–44% cases. Postoperative management included corticosteroids, antifungals, and nasal irrigation.

Conclusions:

AFRS imposes a high burden through poor QoL, frequent surgery, and high recurrence rates. Environmental factors influence disease prevalence. Comorbidity and symptom burden varied by study population and geography. Advances in care such as the US-FDA approved biologic dupilumab, represents as an alternate treatment option for patients (≥6 years) with a history of sino-nasal surgery.

Poster #A157

Temporary visual impairment and ophthalmoplegia after intranasal anesthetic infiltration

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Introduction:

Nasal obstruction is a common complaint in

otolaryngology. Over the past decade, there has been an increase in office-based procedures to alleviate nasal obstruction. This has also led to greater usage of various in-office local anesthetic techniques. We describe a rare patient complication of temporary blindness, and ophthalmoplegia after infiltration of local anesthetic to address nasal obstruction.

Case Presentation:

A 38-year-old male presented with persistent bilateral nasal obstruction despite previous medical and surgical management. On exam, a prominent septal swell body, hypertrophic inferior turbinates, and nasal valve collapse were noted. The patient elected to proceed with an in-office temperature-controlled radiofrequency ablation procedure. During infiltration of a local anesthetic in the left nasal septum, the patient experienced sudden retro-orbital pain, visual cloudiness, and diplopia in the left eye. Examination revealed extensive blanching of the left nose, glabella, and forehead. The patient could perceive light but was unable to count fingers or recognize faces. After 14 minutes, the patient's symptoms completely resolved. No further local was used and the procedure was completed as planned.

Conclusion:

Visual impairment and ophthalmoplegia is a rare complication of intranasal local anesthetic infiltration. It is vital that otolaryngologists are aware of this potential complication and consider mitigation strategies prior and during anesthetic injection. Clinicians should also be aware of possible diagnostic and therapeutic interventions in case of its occurrence including but not limited to rapid visual exam, urgent ophthalmic consultation, and imaging to rule out an orbital hematoma.

Poster #A158

Tezepelumab improves nasal airflow in adults with uncontrolled CRSwNP from WAYPOINT

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POSTERS

Background:

Tezepelumab significantly reduced nasal polyp size and nasal congestion and improved sinonasal symptoms versus placebo over 52 weeks in adults with uncontrolled chronic rhinosinusitis with nasal polyps (CRSwNP) in WAYPOINT (NCT04851964). This post hoc analysis assessed nasal peak inspiratory flow (NPIF) to determine the effect of tezepelumab on nasal congestion and functional nasal obstruction.

Methods:

Proportions of responders in the tezepelumab and placebo groups were assessed at weeks 24 and 52, overall and by baseline NPIF subgroup (≤ 120 L/min; < 120 L/min is associated with nasal obstruction). NPIF responders had a minimal clinically important difference of ≥ 20 L/min improvement from baseline.

Results:

Overall, 408 patients (tezepelumab n=203, placebo n=205) received at least one dose of study drug over 52 weeks. Tezepelumab improved the change from baseline in NPIF versus placebo by 23.18 L/min (95% CI: 6.44, 39.92) at week 24 and 22.06 L/min (95% CI: 6.31, 37.81) at week 52. There was a greater proportion of responders with tezepelumab versus placebo at week 24 (43.3% [88/203] vs 26.8% [55/205]; odds ratio [OR]: 2.14 [95% CI: 1.38, 3.33]) and week 52 (35.5% [72/203] vs 21.0% [43/205]; OR: 1.71 [95% CI: 1.08, 2.71]). Similar results were seen in tezepelumab versus placebo recipients with a baseline NPIF < 120 L/min at week 24 (46.9% [67/143] vs 30.5% [46/151]; OR: 2.07 [95% CI: 1.25, 3.42]) and week 52 (39.9% [57/143] vs 25.2% [38/151]; OR: 1.64 [95% CI: 0.98, 2.76]).

Conclusion:

Tezepelumab improved nasal congestion in adults with uncontrolled CRSwNP, including those with baseline nasal obstruction, as demonstrated by improvements versus placebo in NPIF seen by week 24 of treatment and sustained to week 52.

Poster #A159

Tezepelumab reduces sinus inflammation and opacification in adults with CRSwNP from WAYPOINT

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Background:

Tezepelumab significantly reduced nasal polyp (NP) size, nasal congestion, the need for NP surgery and systemic corticosteroids, and improved sinonasal symptoms over 52 weeks versus placebo in adults with uncontrolled chronic rhinosinusitis with nasal polyps (CRSwNP) in the WAYPOINT trial (NCT04851964). Tezepelumab also significantly improved Lund-Mackay (LMK) scores of sinus opacification compared with placebo at week 52. This analysis further assessed sinus opacification via CT scans using the Zinreich-modified LMK (zLMK) score and a sinus opacification severity score.

Methods:

CT scan opacification changes from baseline to week 52 were quantified by zLMK and a sinus severity score. zLMK scores ranged from 0–5 for each of 5 sinuses and 0–2 for the ostiomeatal complex, with a maximum score of 54 bilaterally; the sinus severity score was calculated from $[(\text{sinus mucosal volume})/(\text{sinus mucosal volume} + \text{sinus air volume})] \times 100$.

Results:

Overall, 408 patients (tezepelumab n=203, placebo n=205) received ≥ 1 dose of study drug over 52 weeks. At baseline, mean (SD) zLMK scores were 40.22 (9.18) and 38.43 (10.46), and sinus severity scores were 85.20 (16.81) and 81.57 (19.00) in tezepelumab and placebo recipients, respectively. At week 52, improvements were observed with tezepelumab compared with placebo in zLMK score (-17.52 [95% CI, -18.71 , -16.33] vs -1.11 [95% CI, -2.29 , 0.08]; least-squares (LS) mean difference vs placebo [95% CI]: -16.41 [-18.10 ,

POSTERS

−14.73]) and sinus severity score (−32.75 [95% CI, −35.05, −30.46] vs −1.98 [95% CI, −4.27, 0.31]; LS mean difference vs placebo [95% CI]: −30.78 [−34.02, −27.53]).

Conclusion:

Tezepelumab reduced sinus inflammation and opacification in adults with uncontrolled CRSwNP.

Poster #A160

The behavioral impact of alcohol sensitivity in AERD

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Background:

A significant subset of patients with aspirin-exacerbated respiratory disease (AERD) experience alcohol-induced reactions that include respiratory symptoms (RS). The behavioral and social strain due to alcohol sensitivity in AERD remains poorly understood.

Methods:

A REDCap survey was completed by patients with AERD. Survey items included alcohol-induced symptom history and associated behavioral changes. RS were grouped by upper respiratory (UR)-alone symptoms (“stuffy nose/ nasal congestion, runny nose”) or lower respiratory (LR) (“shortness of breath, wheezing”). Social burden was stratified by missed social event frequency (“never”, “occasionally”, or “many”). SNOT-22 and Asthma Control Test (ACT) scores were used to assess baseline symptom control.

Results:

Among 500 respondents who reported RS, 87.2% reported a decrease in alcohol use. Significant differences were observed between the higher median SNOT-22 scores of patients who missed “many” (median SNOT-22 of 64.5) events versus patients who “never” (48.0, $p<0.0001$) or “occasionally” (52.0, $p=0.002$) missed a social event. ACT median score analysis revealed significant differences between the “never” (median ACT of 21.0) versus “occasionally” patients (20.0, $p=0.0037$)

and between “never” versus “many” patients (20.0, $p=0.0298$). Individuals with LR were more likely to decrease alcohol consumption than UR patients ($p=0.0012$). LR patients were highly represented within the “many” subset (84.2% LR, 15.8% UR) whereas the “occasionally” (LR 48.3%, UR 51.7%) and “never” (LR 55.4%, UR 44.6%) patients were more evenly distributed by symptom type.

Conclusion:

Alcohol sensitivity reactions in AERD patients result in decreased alcohol consumption and social changes.

Poster #A161

Timing of biologic therapy relative to initial ESS for CRSwNP

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Chronic rhinosinusitis with nasal polyps (CRSwNP) is traditionally treated with endoscopic sinus surgery (ESS). Currently, no standardized guidelines exist for the optimal timing of biologic administration relative to ESS. This study characterizes patterns of biologic use relative to initial ESS to inform treatment guidelines. We performed a retrospective cohort study in the Merative™ MarketScan® Commercial Database.

We identified every patient diagnosed with nasal polyps who underwent initial endoscopic sinus surgery in 2022. Every patient was continuously enrolled with medical and outpatient prescription drug coverage from one year before through two years after their surgery. We identified whether and when patients received biologics, including dupilumab, mepolizumab, benralizumab, or omalizumab. The cohort included 2019 patients with a mean age of 43.3 years (SD 13.7) and who were 57.6% male. In total, 33.4% of patients received biologics, of whom 25.4% received biologics before surgery. Of the patients who received biologics after surgery, 55.9% received them within 90 days, 9.5% between 91-180 days, 5.2% between 181-270 days, 6.2% between 271-360 days, and 23.3% more than 360 days of surgery. Findings show substantial biologic use (33.4%) among patients undergoing initial ESS. Significant

POSTERS

heterogeneity in timing was observed, with 23.3% starting biologics more than one year post-surgery, highlighting a lack of standardized practice. Future research should evaluate the impact on clinical outcomes associated with the variance in timing of biologic administration.

Poster #A162

WITHDRAWN

Poster #A163

Treatment of nasal airway obstruction in austere environments

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Raman Pannu

Nasal airway obstruction (NAO) is a common condition worldwide, yet access to treatment remains severely limited in areas with scarce medical resources. While commonly treated with daily pharmacologic or surgical interventions, these solutions often prove to be inaccessible for the general population in Third World countries. Distance from treatment centers, costs of procedures and medications, and the lack of personnel to diagnose and manage care for chronic conditions all exist as roadblocks in communities around the world.

Minimally invasive nasal treatments may provide a reliably economic, safe, and effective alternative to consistent medication or invasive surgical interventions in resource limited spaces. On a recent medical mission to Migori, Kenya, our surgical team took office-based radiofrequency equipment and supplies and offered treatments to appropriate candidates. Appropriate candidates were screened, treated, and follow up patient reported outcomes recorded.

Practical and logistical problems were encountered throughout the process, such as getting devices through customs, encountering risks with the high prevalence of blood borne diseases, and limited patient follow-up opportunities. The information gathered from this experience can be used to further efforts to efficiently and effectively treat chronic conditions with novel devices in communities that desperately need it. Future considerations for care may include new procedures for the safe processing and re-use of typically disposable devices.

Poster #A164

Underreporting of olfactory dysfunction

Isaac Elijah
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Background:

Olfactory dysfunction is known to be highly prevalent in various disease states when directly examined, yet under recognition and under reporting of olfactory impairment persists. The purpose of this study is to highlight the extent of reporting of olfactory loss by examining rates of anosmia and parosmia in various sinonasal, neurodegenerative, and infectious conditions.

Methods:

The TriNetX Research Network was queried to construct cohorts of adults with sinonasal inflammatory disorders (e.g., chronic rhinosinusitis (CRS)), post-viral infections, and neurodegenerative diseases (e.g., Alzheimer's disease, Parkinson's disease, etc.). The primary measured outcome was the prevalence of reported anosmia and parosmia in each cohort prior to and after diagnosis.

Results:

A total of 3,021,914 individuals had CRS with or without nasal polyps, and the prevalence of anosmia and parosmia were only 1.45% and 0.7%, respectively. Of 10,126,154 adults with viral upper respiratory infections, anosmia and parosmia prevalence was 0.37% and 0.13%, respectively. Of the 1,476,775 adults diagnosed with Alzheimer's disease, Parkinson's disease, mild cognitive impairment, or Lewy Body, frontotemporal, or vascular dementia, the prevalence of anosmia and parosmia were only 0.53% and 0.24%, respectively.

Conclusions:

The prevalence of olfactory dysfunction identified in this national database are significantly decreased compared to the known prevalence of anosmia and parosmia in each of the disease categories. Olfactory dysfunction is severely under-diagnosed and under-reported. Increased awareness of the impact of this condition is necessary to improve reporting practices, which will influence third party coverage of diagnosis and treatment.

POSTERS

Poster #A165

Utilization of posterior nasal nerve ablation among Medicare beneficiaries, 2014-2024

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Introduction:

The FDA cleared cryoablation and radiofrequency (RFA) devices for posterior nasal nerve ablation (PNN) in 2017 and 2019, respectively. However the AMA did not establish device-specific CPT codes until 2024. We investigated trends in Medicare utilization and spending for PNN.

Methods:

We analyzed PNN utilization and spending among Medicare FFS beneficiaries between 2014-2024 using public Part B Summary data. We focused analysis on 2 code types: (1) non-specific codes (30117/30999) that describe PNN via neurolysis and were previously used for nasal valve RFA (pre-2023) and device-based PNN (pre-2024); (2) cryoablation (31243)/RFA (31242) codes. We normalized utilization to beneficiary enrollment (procedures per million beneficiaries; PPMB) and inflation-adjusted spending to 2024 USD.

Results:

Between 2014-2022, Medicare utilization and spending for non-specific codes totaled 97,919 procedures and \$54.1m, and increased at compound annual growth rates of 29.2% and 30.5%, respectively. In 2023, utilization (+132.7 PPMB, relative difference [RD]: +18.5%) for non-specific codes increased despite nasal valve RFA code introduction; spending remained stable (RD: -0.4%) due to decreased procedural reimbursement. In 2024, utilization (-212.0 PPMB, RD: -24.9%) and spending (-3.72m, RD -33.3%) for non-specific codes declined, but device-based PNN more than offset the difference (utilization: +335.3 PPMB, spending: \$15.8m). Among device-based PNN procedures, 65.5% were RFA and 34.5% were cryoablation.

Conclusion:

Medicare utilization and spending increased following introduction of device-specific CPT

codes for PNN; RFA was the dominant method. Further research is needed to determine factors influencing PNN utilization.

Poster #A166

Validity of diagnosing acute bacterial rhinosinusitis by history alone

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Introduction:

Acute bacteria rhinosinusitis (ABRS) is frequently diagnosed based on patient-reported symptoms, despite substantial overlap with viral ARS and other noninfectious conditions.

Goal:

To determine the diagnostic accuracy of patient history alone, obtained via individual SNOT-22 item responses, for diagnosing ABRS using nasal endoscopy.

Methods:

Retrospective cohort study of adult patients evaluated for suspected ABRS. Patients were classified as ABRS-positive or ABRS-negative based on endoscopic findings purulence. Eight predefined symptoms (blow nose, nasal obstruction, nasal drainage, runny nose, postnasal drainage, cough, loss of smell, and facial pain) were analyzed as present/absent. Sensitivity and specificity were calculated for each individual symptom. A composite symptom score was created by summing the number of positive symptoms (range 0–8). Receiver operating characteristic (ROC) curve analysis was performed to assess the overall diagnostic performance of the composite score.

Results:

A total of 214 patients were included with 264 visits evaluated. 162 visits had endoscopically confirmed ABRS. Individual symptom sensitivities ranged from 1.9% to 75.9%, while specificities ranged from 43.1% to 99%. The composite symptom score demonstrated an area under the ROC curve (AUC) of 0.7 (95% CI [0.6–0.8]). A cutoff of ≥ 4 symptoms yielded a sensitivity of 74.1% and specificity of 53.9%. On multivariable analysis, postnasal drainage was independently associated with ABRS (OR=2.0, 95% CI 1.1,3.9).

POSTERS

Conclusion:

History-based symptom assessment demonstrates acceptable diagnostic accuracy for ABRS. While certain symptom combinations improve specificity, reliance on patient history alone may result in overdiagnosis.

Poster #A167

Video-based intervention for rhinologic instrumentation training

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Introduction:

Formal education on rhinologic surgical instrumentation during residency is not standardized, with wide variations in instruction. Prior work in general otolaryngology has found that only 8% of residents receive instrument-specific training. We created and assessed the effectiveness of a brief video-based intervention on resident knowledge and confidence.

Methods:

Otolaryngology residents from Accreditation Council for Graduate Medical Education (ACGME)-accredited U.S. residency programs completed a 20-question survey identifying common rhinologic instruments before and after viewing a 5-minute educational video. Participants rated their confidence for each response on a 5-point Likert scale. Pre- and post- intervention scores and confidence levels were compared using paired t-tests.

Results:

Of 90 respondents, 58 completed both pre- and post-intervention surveys. Participants spanned all training levels (PGY-1 to PGY-6) and geographic regions. Mean scores increased from 16.7/20 to 19.0/20 ($\Delta=2.3$, $p<.0001$) while confidence levels rose from 3.9/5 to 4.8/5 ($\Delta=0.9$, $p<.0001$). The largest increase in mean scores was observed among PGY-1 residents ($\Delta=3.6$). The greatest improvements were seen in the identification of the Jansen-Middleton forceps and frontal sinus curettes.

Conclusions:

A brief educational video significantly improved residents' knowledge and confidence in instrumentation and could serve as an effective

tool to support preparation prior to rhinologic cases.

Poster #A168

Infant nasal microbial and clinical signatures linked to early neurodevelopment

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Background:

The nasal microbiome is an emerging regulator of CNS homeostasis, yet clinically relevant microbial profiles linked to specific neurodevelopment remains poorly characterized. This study applied an integrated machine learning framework to identify microbial biomarkers of neurodevelopment.

Methods:

59 infants (~1-year of age), prospectively enrolled from rural Bangladesh, were evaluated across neurocognitive domains using the Ages and Stages Standardized Child Development Questionnaire (ASQ). The nasal microbiota was profiled using 16S rRNA sequencing. Analysis included ANCOM-BC2, multivariable linear models and LUCIDus, which jointly modeled microbial, clinical and environmental variables and ASQ outcomes. Models adjusted for antibiotic and ambient outdoor particulate matter exposure, age, delivery mode, sex, and birthweight.

Results:

Microbial community configuration (e.g., alpha diversity and latent ecological states) was associated with higher neurodevelopment ($P<0.05$). 11 microbial genera were associated with domain specific neurodevelopmental scores (FDRs < 0.05). For example, *Helcococcus* was positively associated with communicative, problem solving motor, and social scores (FDRs < 0.05). LUCIDus identified distinct microbial profiles, including differential *Helcococcus*, *Moraxella* and *Haemophilus* enrichment, which were associated with higher neurodevelopment scores.

Conclusion:

This study identifies nasal microbial profiles linked to neurodevelopment across motor, communicative, social, and problem-solving

POSTERS

domains. These findings support the nasal microbiome as a biologically integrated contributor to early neurodevelopment and highlight targets for mechanistic investigation and early-life intervention.

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