American Rhinologic Society

COSM 2026

April 25-26, 2026

Phoenix Convention Center
Phoenix, AZ

PROGRAM GUIDE

Amber Luong, MD, PhD, FARS

Presidential Welcome

Welcome to the 2026 ARS at COSM meeting!

Welcome to the beautiful city of Phoenix and to the 2026 American Rhinologic Society meeting at COSM! I hope you are looking forward as much as I am to the 1.5 days of science, collaboration, and community. This year's program brings together the latest research across the spectrum of sinonasal disease, including groundbreaking work in olfaction, advances in CRS management with the interaction of surgery, topical medication and biologics, and important updates on skull base tumors. We are also delighted to showcase high-impact basic and translational science, beginning with our **Top Basic Science** and **Top Clinical Science** oral presentations. I would like to congratulate Dr. Marc Dubin for his tremendous efforts in shaping this exceptional agenda.

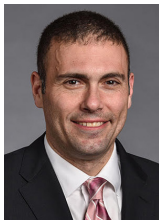
In addition to the original science, there will several expert-driven panels on balloon sinuplasty, spontaneous CSF leaks, physician–industry partnerships, executive coaching and leadership development, and some of the most influential bench research of our time. There is also a brand-new format this year, Jeopardy: Rhinology Edition, which promises to be both educational and spirited. And personally, I cannot wait to hear our distinguished colleagues take on the nearly impossible task of choosing their favorite pieces of bench research from the past 20 years, no small feat!

In addition to the scientific sessions, this meeting is also a wonderful opportunity to engage with ENT-focused industry partners who help drive innovation in the tools, technologies, and therapeutics that enhance the care we provide every day. I encourage you to spend time with our exhibitors throughout the meeting and learn about the latest offerings that may elevate your clinical practice. Finally, I warmly invite all of you to the **President's Reception on Saturday evening**, an ideal moment to relax, reconnect with colleagues, and build new collaborations in a welcoming and festive setting.

Welcome again, and thank you for being part of this vibrant ARS community. Enjoy the meeting!

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

ARS Spring Meeting at COSM - Welcome!
from the President-Elect & Program Chair


Marc Dubin, MD, FARS

Welcome to the 2026 American Rhinologic Society Spring Meeting in Phoenix, Arizona. Each year COSM gives us the opportunity to step away from our daily practices and come together as a focused rhinology community. This year's program reflects the strength, growth, and energy of our field.

We received more than 300 submissions for presentation, an extraordinary response that speaks to the scientific momentum within rhinology. From those submissions, 71 oral presentations and 160 abstracts were selected, representing a broad range of clinical, translational, and basic science work. The depth and quality of what you will see over these two days should make all of us proud.

Our panel discussions were designed to be practical, candid, and forward looking. We are reprising Dr. David Poetker's infamous "Jeopardy, Rhinology Edition", which promises to be as entertaining as it is educational. We will revisit balloon dilation more than twenty years after its introduction and take an honest look at where it stands today. Additional panels will address physician industry partnership, spontaneous CSF leaks and the current standard of care, executive coaching, the rhinology workforce, and advocacy. Our International Committee is sponsoring a session on international fellowship training, highlighting the global reach of our specialty.

Beyond the podium, our sections continue to strengthen the fabric of the Society. The Skull Base Section will host an evening event on Friday, April 24 and Women in Rhinology will gather Saturday evening, April 25. The Young Rhinologist Section will hold a breakfast on the morning of April 26. These events are not simply add ons to the program. They are where mentorship, collaboration, and long term friendships are built. We will conclude Saturday's program with the President's Reception, an opportunity to reconnect and celebrate the work of this community.

Phoenix provides a fitting backdrop for this year's meeting. Surrounded by desert landscape and open skies, it is a place that invites both focus and perspective. I hope you take time to enjoy the setting while you are here.

What continues to stand out to me about this meeting is not just the science, but the people. The hallway conversations. The spirited debates. The willingness to challenge assumptions and improve what we do for patients. Thank you for contributing your work, your time, and your commitment to the ARS.

I look forward to seeing you in Phoenix.

ARS at COSM 2026 Program Committee

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Program Chair

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Angela Donaldson, MD, FARS
Marc Dubin, MD, FARS
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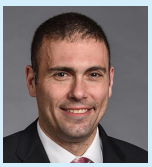

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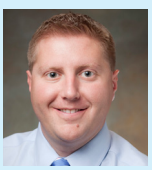

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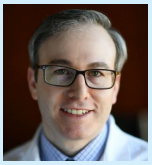

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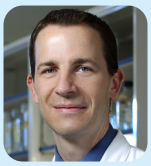
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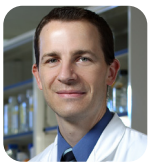

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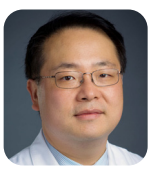

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Devyani Lal, MD, FARS

YOUNG RHINOLOGISTS SECTION
Erin Lopez, MD, FARS

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 10.75 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 basic science discoveries in CRS pathogenesis—including type 2 inflammation, transcriptomics, immune profiling, and environmental exposure effects—into clinical decision-making.
- Evaluate comparative effectiveness data for biologics versus surgical intervention in CRSwNP and related inflammatory disease states to optimize patient-specific treatment selection.
- Assess evolving evidence on balloon dilation, posterior nasal nerve ablation, and in-office technologies, distinguishing appropriate use from misconceptions based on long-term outcome data.
- Apply contemporary algorithms for spontaneous CSF leaks and complex skull base pathology, incorporating perioperative risk assessment and postoperative management strategies.
- Interpret advances in olfactory dysfunction management, including PRP therapy, neuromodulation, organoid modeling, and validated psychometric instruments.
- Analyze the role of artificial intelligence and machine learning in rhinology, including predictive modeling, image-based diagnostics, SNOT-22 analytics, and clinical decision support.
- Incorporate environmental and population-level research findings (e.g., particulate exposure, NO□/O□, geospatial access disparities) into counseling and longitudinal management of rhinologic disease.
- Recognize evolving trends in healthcare utilization, reimbursement, and payer denials, and implement strategies to improve practice sustainability and patient access to care.
- Apply evidence-based perioperative management principles, including VTE risk stratification, opioid stewardship, medication reconciliation, and complication mitigation.
- Demonstrate ethical and professional engagement in physician–industry collaboration, advocacy, leadership, and workforce development to strengthen the future of rhinologic practice.
- Critically appraise translational and bench research and identify opportunities to translate novel discoveries into future clinical innovation.

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 at COSM 2026 Scientific Abstract Reviewers

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 Fourm: Allergy & Rhinology*

Dara Adams
Omar Ahmed
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As of 4/6/26

PROGRAM AT-A-GLANCE

MEETING HIGHLIGHTS

- 2 days, 1 afternoon breakout session, and 1 morning breakout session
- 71 oral scientific presentations
- 160 poster presentations
- Skull Base and Orbital Surgery Section - Friday evening event
- Women in Rhinology Section - Saturday evening event
- Young Rhinologists Section - Sunday morning breakfast session
- President's Reception
- Panels highlighting:
  - Jeopardy, Rhinology Edition
  - Balloon Dilation, more than twenty years after its introduction, and where it stands today
  - Physician industry partnerships – doing it ethically and successfully
  - Spontaneous CSF leaks and the current standard of care
  - Executive coaching and leadership development
  - The rhinology workforce
  - Advocacy
  - Best bench research
  - International fellowship training
- Maximum of 10.75 AMA PRA Category 1 Credit(s)™

Friday, April 24, 2026

7:00 am – 12:00 pm
ARS Strategic Planning Meeting
Sheraton, Valley of the Sun B

1:00 pm – 5:00 pm MST
ARS Board of Directors Meeting
Sheraton Hotel, Valley of the Sun C

Saturday, April 25, 2026
General Session
Convention Center, 105 ABC
8:00 am – 5:00 pm MST

8:00 am – 8:05 am
Welcome
Amber Luong, MD, PhD, FARS

Room Moderator: Marc Dubin, MD, FARS

Oral Presentations: Top Basic Science

Session Moderators: Angela Donaldson, MD, FARS; Arthur Wu, MD, FARS

8:05 am – 8:13 am
PM exposure upregulates endocytic pathways and particle uptake
Amabir Gill, MD

8:14 am – 8:22 am
IL-13-induced signaling pathways and chitinase production in human and mouse olfactory stem cells
Paul Cowen, MD

8:23 am – 8:31 am
A novel murine model of upper airway specific type 2 inflammation
Tolani Olonisakin, MD, PhD

8:32 am – 8:40 am
Increased CFTR 5T allele prevalence in refractory CRSwNP
Peter Giannaris, BS

8:41 am – 8:49 am
Immune signatures of response to platelet-rich plasma therapy for post-viral olfactory dysfunction
Vivienne Li, BA

8:50 am – 8:55 AM
Q&A

8:56 am – 9:05 am
Awards Ceremony
Charles Ebert, Jr., MD, FARS; Amber Luong, MD, PhD, FARS; Marc Dubin, MD, FARS

9:05 am – 9:45 am
PANEL: Jeopardy (Rhinology Edition)
Moderator: David Poetker, MD, FARS
Panelists: Omar Ahmed, MD, FARS; Jeremiah Alt, MD, PhD, FARS; Erin O'Brien, MD, FARS; Vijay Ramakrishnan, MD, FARS

9:45 am – 10:15 am
Break with Exhibitors

Oral Presentations: Top Clinical Science

Session Moderators: Jessica Grayson, MD; Christopher Ito, MD, FARS

10:15 am – 10:23 am
SNEC and SNUC survival can be predicted by nasal tuft cell markers
Michael Kohanski, MD, PhD, FARS

10:24 am – 10:32 am
Laser posterior nasal neurolysis RCT
Chien Yu Huang, MD

10:33 am – 10:41 am
Validation of an allergic rhinitis instrument which synergizes with the sino-nasal outcome test
Selena Zhang

10:42 am – 10:50 am
Uninterrupted CPAP use after anterior skull base surgery – A prospective study
Syed Omar Ali, MD

10:51 am – 10:59 am
AI-driven SNOT-22 analysis predicts rhinology surgical candidacy in 35,000+ patients
Michael Sramek, MD

11:00 am – 11:05 am
Q&A

11:05 am – 11:55 am
Panel: Balloon Dilation 20+ Years Later: Data, Misconceptions, and Appropriate Use
Moderator: Kristine Smith, MD, FARS
Panelists: Seth Brown, MD, FARS Nyssa Farrell, MD; Thomas Higgins, MD, FARS; Jay Piccirillo, MD

11:55 am – 12:00 pm
Q&A

12:00 pm – 1:00 pm
Lunch with Exhibitors

Room Moderator: Greg Davis, MD, FARS

Session Moderators: Victoria Lee, MD, FARS; Kibwei McKinney, MD

1:00 pm – 1:06 pm
Biologics impact the volume of endoscopic sinus surgery and referral patterns
Daniel Lee, MD, FRCSC

1:07 pm – 1:13 pm
Cost-effectiveness of ESS versus biologics for chronic rhinosinusitis with nasal polyps
Jerry Hadi Juratli, BS

1:14 pm – 1:20 pm
Comparative outcomes of biologics versus surgery for CRSwNP in real-world practice
Omer Baker, BS

1:21 pm – 1:27 pm
Are we operating less on CRSwNP in the biologics era?
Samuel Kaefer, MD

1:28 pm – 1:34 pm
The utilization of the completeness of surgery index in revision ESS patients on biologic therapy
Margaret Mitchell, MD, MS-HPEd

1:35 pm – 1:40 pm
Q&A

1:41 pm – 2:11 pm
Panel: Physician-Industry Partnerships: Doing it Ethically & Successfully in Private Practice and Academia
Moderator: Greg Davis, MD, FARS
Panelists: Martin Citardi, MD, FARS; David Conley, MD, FARS; Cecelia Damask, DO; Randall Ow, MD

Session Moderators: Do-Yeon Cho, MD; Corinna Levine, MD, FARS

2:12 pm – 2:18 pm
Venous thromboembolism and bleeding in endoscopic skull base surgery: Impact of postoperative anticoagulation and caprini score
Noam Koch, MD

2:19 pm – 2:25 pm
Cost-utility of GLP-1 receptor agonists in idiopathic intracranial hypertension
Joanna Lin, BA

2:26 pm – 2:32 pm
Quality-of-life outcomes following endoscopic transsphenoidal surgery: A multi-center analysis
Jack Olmstead, PhD

2:33 pm – 2:39 pm
Incidence and management of mucoceles following open skull base surgery
Ran Bilaus, MD

2:40 pm – 2:46 pm
Clinical outcomes of oligometastatic nasopharyngeal carcinoma
Abdulghafoor Alani, BS

2:47 pm – 2:55 pm
Q&A

2:56 pm – 3:29 pm
Break with Exhibitors

Session Moderators: Karen Bednarski, MD, FARS; David Gudis, MD, FARS

3:30 pm – 3:36 pm
A pilot evaluation of a novel fluid evacuation device in endoscopic sinonasal surgery
Corinne Stonebraker, BA

3:37 pm – 3:43 pm
Wearable technology: Is the future of in-office medical interpretation here?
Emma Anisman, BA

3:44 pm – 3:50 pm
WITHDRAWN

3:51 pm – 3:57 pm
AI-assisted pill identification to improve medication reconciliation in ENT clinics
Mannut Singh

3:58 pm – 4:04 pm
6-month outcomes of sinus dilation with a paclitaxel-coated balloon for treatment of recurrent CRS
Fabio Vega, MD

4:05 pm – 4:10 pm
Q&A

4:11 pm – 4:55 pm
Panel: Spontaneous CSF Leaks: Contemporary Algorithms
Moderator: Corinna Levine, MD, FARS
Panelists: Jessica Grayson, MD; Kibwei McKinney, MD; Erin Reilly, MD; Sanjeet Rangarajan, MD, FARS

4:55 pm – 5:00 pm
Q&A

5:00 pm – 5:30 pm
ARS Business Meeting

5:30 pm – 7:00 pm
ARS President's Reception
Sheraton, Phoenix DE

Saturday, April 25, 2026
Afternoon Session – Room 2
Convention Center, 102 ABC
1:00 pm – 5:00 pm MST

Room Moderator: Jivianne Lee, MD, FARS

Session Moderators: Michael Kohanski, MD, FARS; Lauren Roland, MD

1:00 pm – 1:06 pm
Olfactory training, quality-of-life and neuropsych outcomes: A systematic review and meta-analysis
Joon Soo Kim, BS

1:07 pm – 1:13 pm
Psychometric evaluation of novel olfactory measure, u-smell-it, in chronic rhinosinusitis
Claire Perrin, BS

1:14 pm – 1:20 pm
Gabapentin response in parosmia: A two-year retrospective review
Do-Yeon Cho, MD

1:21 pm – 1:27 pm
Efficacy of platelet-rich plasma therapy for persistent olfactory dysfunction: A meta-analysis
Tommy Jacob, MD, MPH

1:28 pm – 1:34 pm
Response to olfactory dysfunction: A cluster analysis from a tertiary smell and taste clinic
Tom Fischer, MD

1:35 pm – 1:40 pm
Q&A

1:41 pm – 2:11 pm
Short Panel: Executive Coaching & Leadership Development for Rhinologists
Moderator: Stephanie Joe, MD, FARS
Panelists: Dara Adams, MD; Karen Bednarski, MD, FARS; Richard Orlandi, MD, FARS; John Schneider, MD
Sponsored by the Mentorship Committee

Session Moderators: Garret Choby, MD, FARS; Jose Mattos, MD

2:12 pm – 2:18 pm
Traffic exposure and greenspace in CRS
Stefany Lazieh, BA

2:19 pm – 2:25 pm
Temporal and geospatial market analysis of endoscopic sinus surgery
Akshay Warrier, BA

2:26 pm – 2:32 pm
Medicare advantage denials for rhinologic procedures subject to independent review, 2023-2024
Ericka Erickson, MD, MBA

2:33 pm – 2:39 pm
Comparative analysis of frailty indices in endoscopic sinus surgery
Akshay Warrier, BA

2:40 pm – 2:46 pm
Psychometric validity of the overall symptom severity score for chronic rhinosinusitis
Christine Lee, BA, MPH

2:47 pm – 2:55 pm
Q&A

2:56 pm – 3:29 pm
Break with Exhibitors

Session Moderators: Omar Ahmed, MD, FARS; Kara Detwiller, MD, FARS

3:30 pm – 3:36 pm
Temperature-controlled versus impedance-controlled posterior nasal nerve radiofrequency ablation
Prem Patel, BS

3:37 pm – 3:43 pm
Neuroimmune effects of TCRF PNN ablation for chronic rhinitis
Elina M. Toskala-Kennedy, MD, PhD, FARS

3:44 pm – 3:50 pm
Real-world TCRF outcomes in NAO patients
Jordan Pritikin, MD, FARS

3:51 pm – 3:57 pm
Impact of TCRF posterior nasal nerve ablation on midfacial migraine and disability outcomes
Mark Mehle, MD

3:58 pm – 4:04 pm
Healthcare resource utilization after TCRF treatment of NAO
David Kennedy, MD, FACS, FRCSI, FARS

4:05 pm – 4:10 pm
Q&A

4:11 pm – 4:55 pm
Panel: The Future of Rhinologic Training & Workforce Implications
Moderator: Stacey Gray, MD, FARS
Panelists: Noel Ayoub, MD; Seth Brown, MD, FARS; Dana Crosby, MD, FARS; Janalee Stokken, MD, FARS

4:55 pm – 5:00 pm
Q&A

5:00 pm – 5:30 pm
ARS Business Meeting

5:30 pm – 7:00 pm
ARS President's Reception
Sheraton, Phoenix DE

Sunday, April 26, 2026
General Session
Convention Center, 105 ABC
8:00 am – 12:00 pm MST

7:00 am – 8:00 am
Young Rhinologists Section Breakfast
Room: Convention Center, 105 ABC

Room Moderator: R. Peter Manes, MD, FARS

Session Moderators: Michael Marino, MD, FARS; Christopher Roxbury, MD, FARS

8:00 am – 8:06 am
Multi-omic profiling of noninvasive and invasive fungal sinusitis
Khai Nguyen, PhD

8:07 am – 8:13 am
WITHDRAWN

8:14 am – 8:20 am
Eosinophil-dependent PAPP-A patterns in chronic rhinosinusitis with nasal polyps
Afaf Ennahal

8:21 am – 8:27 am
Transcriptome of type 2 CRS
Naweed Chowdhury, MD, MPH

8:28 am – 8:32 am
Q&A

Session Moderators: Naweed Chowdhury, MD, MPH; Chadi Makary, MD, FARS

8:33 am – 8:39 am
Therapeutic potential of RADA16 to reduce allergen and exogenous-CRS related inflammation
Jennifer Mulligan, PhD

8:40 am – 8:46 am
TP53 codon 72 polymorphism and MUC5AC endotypes in CRSsNP
Michael Price, MD, PhD

8:47 am – 8:53 am
Surgery-induced changes in peripheral immune cell subsets differ between CRSwNP and AERD
Kathleen Bartemes, PhD

8:54 am – 9:00 am
Ancestry-stratified genetic analysis of CRS in minority populations
Akshay Prabhakar, BSA

9:01 am – 9:04 am
Q&A

9:05 am – 9:30 am
Panel: Advocacy as a Professional Imperative
Moderator: Devyani Lal, MD, FARS
Panelists: Elisa Illing, MD, FARS; R. Peter Manes, MD, FARS; Troy Woodard, MD, FARS

9:31 am -10:01 am
Break with Exhibitors

Session Moderators: Stephanie Smith, MD; Dennis Tang, MD, FARS

10:02 am – 10:08 am
Machine learning-based predictive modeling for the development of chronic rhinosinusitis
Justina Varghese, BA

10:09 am – 10:15 am
Wearable sleep monitoring links sinus surgery to improved sleep architecture
Jamie Oliver, MD

10:16 am – 10:22 am
Virtual intraoperative CT with dynamic anatomic updates during ESS
Graham Harris, BA

10:23 am – 10:29 am
Rhinology litigation and well-being
Tanner Frahm, BS

10:30 am – 10:39 am
Q&A

Session Moderators: Sanjeet Rangarajan, MD, FARS; Bobby Tajudeen, MD, FARS

10:40 am – 10:46 am
Irreversible electroporation for the treatment of inferior turbinates
Narin Carmel Neiderman, MD MSc

10:47 am – 10:53 am
Data-driven triage for nasal obstruction
Jamie Oliver, MD

10:54 am – 11:00 am
Opioid prescription trends in septoplasty and inferior turbinate reduction
George Bebawy, BA

11:01 am – 11:07 am
Mometasone rinses as an intermediary option for refractory chronic rhinitis
Justina Varghese, BA

11:07 am – 11:13 am
Q&A

11:15 am – 11:55 am
Panel: Best Bench Research of the 20s: Impact on Patient Care for the Next 20 Years
Moderator: Carlos Ebert, Jr., MD, FARS
Panelists: Anthony Del Signore, MD, FARS; Adam Kimple, MD, FARS; Joshua Levy, MD, FARS; Erin Lopez, MD, FARS

11:55 am – 12:00 pm
Thank you and see you in LA
Amber Luong, MD, PhD, FARS, and Marc Dubin, MD, FARS

Sunday, April 26, 2026
Breakout Room
Convention Center, 102 ABC
8:00 am – 11:13 am MST

Room Moderator: Benjamin Bleier, MD, FARS

Session Moderators: Nyssa Farrell, MD; Mathew Geltzeiler, MD, FARS

8:00 am – 8:06 am
Success of anterior ethmoidal artery flaps for nasal septal perforation repair: A systematic review
Hemali Shah, MD

8:07 am – 8:13 am
Impact of dysplasia on inverted papilloma recurrence
Peter Giannaris, BS

8:14 am – 8:20 am
Complication rates following modified endoscopic Denker's approach
Yasser Almansour, Medical Student

8:21 am – 8:27 am
Early endoscopic closure as a new paradigm for traumatic skull base dural injury
Jessica Grayson, MD

8:28 am – 8:32 am
Q&A

Session Moderators: Patricia Loftus, MD, FARS; Chirag Patel, MD, FARS

8:33 am – 8:39 am
NO2 and O3 exposure in sinonasal inverted papilloma recurrence and tumor extent
Jonathan Wang, MSE

8:40 am – 8:46 am
Post-diagnosis statin use is associated with improved survival in nasopharyngeal carcinoma
Abdulghafoor Alani, BS

8:47 am – 8:53 am
ctDNA for disease monitoring in sinonasal malignancies
Sharon Kim, MD

8:54 am – 9:00 am
Skull base involvement predicts late recurrence in olfactory neuroblastoma
Alexandria Harris, MS, MD

9:01 am – 9:04 am
Q&A

9:05 am – 9:30 am
Panel: Training the World: International Fellowship Training
Moderator: Do-Yeon Cho, MD
Panelists: Catherine Banks, MD; Andy Chua, MD, FARS; Peter Hwang, MD, FARS, Camilo Reyes, MD, FARS
Sponsored by the International Committee

9:31 am – 10:01 am
Break with Exhibitors

Session Moderators: Ashleigh Halderman, MD, FARS; Chadi Makary, MD, FARS

10:02 am – 10:08 am
Modeling age-dependent olfactory function in human olfactory organoids
Randy Bach

10:09 am – 10:15 am
Highly-effective modulator therapy and olfactory-specific gene expression in Cystic Fibrosis
Michael Xiang, BA, MA

10:16 am – 10:22 am
Inflammatory mediators of anosmia in chronic rhinosinusitis
Shvetali Thatte, BS

10:23 am – 10:29 am
Olfactory and gustatory function in diabetes mellitus: A prospective clinical study
Narin Carmel Neiderman, MD, MSc

10:30 am – 10:39 am
Q&A

Session Moderators: Anthony Del Signore, MD, FARS; Carol Yan, MD

10:40 am – 10:46 am
Repurposing azelastine for viral infection prophylaxis: Insights from a retrospective cohort study
Jonathan Vuillier, BS

10:47 am – 10:53 am
Determinants of olfactory cleft deposition
Adam Kaakati, BSE

10:54 am – 11:00 am
Azelastine reduces ARS episodes in RARS patients: A retrospective cohort study
Akshay Prabhakar, BSA

11:01 am – 11:07 am
Q&A

Move to:
General Session – Room 105 ABC
11:15 am – 12:00 pm

11:15 am – 11:55 am
Panel: Best Bench Research of the 20s: Impact on Patient Care for the Next 20 years
Moderator: Carlos Ebert, Jr., MD, FARS
Panelists: Anthony Del Signore, MD, FARS; Adam Kimple, MD, FARS; Joshua Levy, MD, FARS; Erin Lopez, MD, FARS

11:55 am – 12:00 pm
Thank you and see you in LA
Amber Luong, MD, PhD, FARS and Marc Dubin, MD, FARS

ARS POSTER VIEWING

Friday, April 24, 2026, 9:00 am – 7:00 pm
Saturday, April 25, 2026, 9:00 am – 2:45 pm
Phoenix Convention Center West Building
COSM Exhibit Hall 1 & 2

ARS Combined Poster Reception
Friday, April 24, 2026
5:30 pm – 7:00 pm
Phoenix Convention Center West Building
COSM Exhibit Hall 1 & 2

Poster# ARS001
30-Day Complications after FESS for CRS
Phillip Richards, MD

Poster# ARS002
A decade of trends in skull base surgery outcomes
Taral Jella, BA

Poster# ARS003
A pilot evaluation of a novel smoke evacuation device in endoscopic sinonasal surgery
Corinne Stonebraker, BA

Poster# ARS004
A virtual reality simulator for skull base surgery validated across education stakeholders
Troy Weinstein, BSHS

Poster# ARS005
A window to the brain: Reinforcing smell testing in rhinology for early neurocognitive detection
Ibtisam Mohammad, MD

Poster# ARS006
Adverse effects of CRS biologics
Olivia La Monte, MD

Poster# ARS007
AI enhanced diagnostic endoscopy for hereditary hemorrhagic telangiectasia (HHT)
Alexandria Yao, BA

Poster# ARS008
AI for sinusitis clinician and patient education
Emily Kwon, BA

Poster# ARS009
AI tools in clinical research
Randall Ow, MD

Poster# ARS010
AI-assisted development of a computer adaptive SNOT-22 using item response theory
Elena Quinonez Del Cid

Poster# ARS011
AI-based nasopharyngeal detection and localization on brain MRI
Samuel Tercyak, Medical Student

Poster# ARS012
AIFS and climate in the United States
Iris Martin, BA

Poster# ARS013
WITHDRAWN

Poster# ARS014
An anatomically-based biomimetic 3D-printed endoscopic high-speed bone drilling simulation
Corinne Stonebraker, BA

Poster# ARS015
Analysis of the impact of acute rhinosinusitis on quality of life
Chadi Makary, MD, FARS

Poster# ARS016
Anatomic variants in recurrent acute rhinosinusitis: A meta-analysis and retrospective cohort study
Sammy Gao, BS

Poster# ARS017
Aspirin therapy and disease burden in older adults with AERD
Kerol Faltas, BA

Poster# ARS018
Association between respirator mask utilization and post-WTC disaster olfactory dysfunction
Alicia Yang, BA

Poster# ARS019
Association of sex and allergic rhinitis rates in Hispanic/Latino adults: Insight from the HCHS/SOL
Kavya Sudhir

Poster# ARS020
Automated nasal septum segmentation using nnU-net for normal and pathological anatomy
Michael Sramek, MD

Poster# ARS021
Biofilms in CRS: Systematic review
Hunter Holley, MS

Poster# ARS022
WITHDRAWN

Poster# ARS023
Cavernous sinus thrombosis: Presentation, management, and diagnostic delay
Emma Anisman, BA

Poster# ARS024
CF carrier status increases medical burden in chronic rhinosinusitis: A propensity-matched study
David Shimunov, MD

Poster# ARS025
WITHDRAWN

Poster# ARS026
Characterizing the scholarly impact and geographic distribution of rhinology fellowship graduates
Vivienne Li, BA

Poster# ARS027
Chronic rhinosinusitis outcomes related to pharmacy access
Neeti Gandra, BA

Poster# ARS028
Chronic rhinosinusitis referral triage via data-driven centralized scheduling system
Cole VandeVelde, BA

Poster# ARS029
Chronic rhinosinusitis risk in OSA: CPAP compared to HGNS
Udeerna Tippabhatla, BS

Poster# ARS030
Clinical value of histopathological examination of sinus contents following endoscopic sinus surgery
Caroline Rozzo, BS

Poster# ARS031
Coal worker's pneumoconiosis and chronic rhinosinusitis
Ryan Ziltzer, MD, MPH

Poster# ARS032
Combination sinus surgery and septorhinoplasty
Robert Africa, MD

Poster# ARS033
Combined FESS and sequestrectomy for stage 3 maxillary MRONJ
Peter Giannaris, BS

Poster# ARS034
Comparative outcomes of upfront biologic therapy in CRSwNP
David Hoying, MD

Poster# ARS035
Comparing anticholinergic burden and dementia risk in first- and second-generation antihistamines
Ibtisam Mohammad, MD

Poster# ARS036
Comprehensive management of the nasal valve region
Matthew Mendelsohn, MD

Poster# ARS037
Could ENS be prevented with virtual surgery planning?
Nidhi Jha, BA

Poster# ARS038
CRS incidence in patients with OSA
David Dillard

Poster# ARS039
Cumulative steroid exposure and complication risk in chronic rhinosinusitis with nasal polyps
Zachary Whong, BS

Poster# ARS040
Deep learning morphometry of the nasal septum
Michael Sramek, MD

Poster# ARS041
Delayed sinonasal complications after facial feminization surgery: A retrospective case series
Omer Baker, BS

Poster# ARS042
WITHDRAWN

Poster# ARS043
Development of a new sinonasal wound healing scale
Rohan Bellary, BS

Poster# ARS044
WITHDRAWN

Poster# ARS045
Dietary interventions in sinusitis
Emily Sitkowski

Poster# ARS046
Dupilumab and ESS in CRSwNP management
David Hoying, MD

Poster# ARS047
Early changes in biomarkers and S. Aureus with Dupi for CRSwNP
Sai Nimmagadda, MD

Poster# ARS048
Effect of chronic rhinosinusitis on endoscopic DCR outcomes: Single-center cohort
Emma Anisman, BA

Poster# ARS049
Efficient estimation of SNOT-22 total score using a short-item decision tree model
Katrina Bootes, BS

Poster# ARS050
Electronic versus paper SNOT-22 scores in CRS patients
Lauren DiNardo, MD

Poster# ARS051
Environmental exposures on rhinosinusitis using COSMOS data
Clifford He, BA

Poster# ARS052
Eosinophilia in odontogenic sinusitis
Nitish Kumar, MS

Poster# ARS053
Epistaxis and antithrombotic therapy: Outcomes from the nationwide emergency department sample
Uzair Khan

Poster# ARS054
WITHDRAWN

Poster# ARS055
ESS for odontogenic sinusitis meta-analysis
Sophia Angelo, MD

Poster# ARS056
Evaluating AI concordance with CRS surgery guidelines
Hetal Lad, BS

Poster# ARS057
Evaluating artificial intelligence models for patient education on nasal polyps
Hana B. Ruran, BA

Poster# ARS058
Evaluating biologic use for chronic rhinosinusitis with nasal polyposis: A population study
Matthew Saenz, Medical Student

Poster# ARS059
Exploring sleep quality and chronic rhinosinusitis risk using wearable technology
Justina Varghese, BA

Poster# ARS060
Extent of surgery in recurrent acute sinusitis
Lirit Levi, MD

Poster# ARS061
Factors associated with sinonasal surgical scheduling in chronic rhinosinusitis
Mitchell Figueroa, BA

Poster# ARS062
GLP-1 agonists in IIH
Nadine Javier, BS

Poster# ARS063
GLP1 therapy - prospective evaluation of smell and taste
Elinoy Herstain, Medical Student

Poster# ARS064
GLP-1 therapy is associated with reduced CRS treatment burden in patients with obesity
Rishi Katragadda, Medical Student

Poster# ARS065
Healthcare provider preferences for biologic attributes in chronic rhinosinusitis with nasal polyps
Christine Franzese, MD, FARS

Poster# ARS066
Histopathology and treatment of recalcitrant purulent rhinosinusitis
Daniel Ma, BS

Poster# ARS067
Impact of ambient dictation AI on documentation burden and patient satisfaction
Corinne Stonebraker, BA

Poster# ARS068
Impact of dupilumab on infection burden and antibiotic use in CRSwNP and asthma
Emma Anisman, BA

Poster# ARS069
Impact of effective CFTR modulators on extent of ESS among CF patients
Matthew Lin, MD

Poster# ARS070
Impact of FESS on nasal saline irrigation volume retention
Nathan Barefoot, BS

Poster# ARS071
Impact of FESS on the incidence of mental health outcomes in CRS: A real-world database study
Jonathan Rismany, BS

Poster# ARS072
Impact of inflammatory bowel disease on CRS outcomes
Anna Davide, BA, BPH

Poster# ARS073
Impact of silent sinus syndrome on structured histopathology
Sushanth Neerumalla, Medical Student

Poster# ARS074
Incidence and mortality trends: HPV-associated and HPV-independent sinonasal squamous cell carcinoma
Peter Moon, MD

Poster# ARS075
Intraoperative confocal endomicroscopy in endonasal skull base surgery
Ryan Little, MD

Poster# ARS076
Irradiation vs. MMC for optimizing fibroblast support in human nasal epithelial cell culture
Jasmine Jain

Poster# ARS077
Local biomarkers and smell loss in chronic rhinosinusitis: A systematic review and meta-analysis
David Kayekjian, BS

Poster# ARS078
Long-term sinonasal outcomes in patients with acute invasive fungal sinusitis
Peter Moon, MD

Poster# ARS079
Losing sleep over sinusitis: Objective fitbit analysis in the all of us program
Steven Chen, MD, PhD

Poster# ARS080
Low-cost 3D-printed rigid nasal endoscope for surgical simulation
Ashish Dahal, BA

Poster# ARS081
Management of alar depression
Mohsen Naraghi, MD

Poster# ARS082
Management of chronic rhinosinusitis in eosinophilic granulomatosis polyangiitis: A scoping review
Alisha Sharma, BHSc

Poster# ARS083
Measures of efficiency in FESS simulation training
Mackenzie Latour, MD

Poster# ARS084
Measuring parameters for endoscopic repair of the skull base with ALT free flap
Isabella Goncalves, BS

Poster# ARS085
Medicaid coverage and utilization of biologics for CRSwNP
Eric Ramos, Medical Student

Poster# ARS086
Medical and surgical management patterns in patients with idiopathic intracranial hypertension
Jenna Rock, MS4

Poster# ARS087
Modern approaches to septal perforation repair: Endoscopic trends and evolving materials
Ibtisam Mohammad, MD

Poster# ARS088
Nasal airway obstruction repair and mental health
Mishek Thapa, BS

Poster# ARS089
Nasal and olfactory function in uCLND vs non-cleft NAO
Eseosa Odigie, MD

Poster# ARS090
Nasal deviation incidence rate and growth change in pediatric subjects
Kosuke Tochigi, MD, PhD

Poster# ARS091
Nasal septal splints for epistaxis in hereditary hemorrhagic telangiectasia
Erika Gonzalez, Medical Student

Poster# ARS092
Nasopharyngeal airflow dynamics in patulous eustachian tube
Sebastian Guadarrama-Sistos Vazquez, MD

Poster# ARS093
National study of post-EEA complications, interventions, and rising emergency utilization
Jennifer S. Lee, BS

Poster# ARS094
National trends in spontaneous cerebrospinal fluid leaks
Timothy Corpuz, MD

Poster# ARS095
Neutralizing antibodies in allergy biologics
Olivia La Monte, MD

Poster# ARS096
Odor familiarity and recognition
Thomas Scharfenberger, BS

Poster# ARS097
Olfactory loss duration impacts health optimism, self-efficacy, literacy and symptom burden
Ethan Sage, BS

Poster# ARS098
Olfactory outcomes after planum meningioma resection
Margaret Mitchell, MD, MS-HPEd

Poster# ARS099
WITHDRAWN

Poster# ARS100
Patient-reported experiences of empty nose syndrome: A thematic analysis of online forum posts
Ritu Bhalerao, MS

Poster# ARS101
Patterns of metastasis and survival across 20 sinonasal malignancies
Farhoud Faraji, MD, PhD

Poster# ARS102
Physical activity improvements after sinus surgery: A multi-center wearable technology pilot study
Justina Varghese, BA

Poster# ARS103
WITHDRAWN

Poster# ARS104
PM2.5 vs. PM10 impact in CRS
Hunter Holley, MS

Poster# ARS105
Pollutant exposure and Lund-Mackay score
Victor Arechiga, BS

Poster# ARS106
Postoperative dapsone therapy in rhinosporidiosis
AHM Delwar, MD

Poster# ARS107
Practice patterns in the management of rhinitis medicamentosa: A survey of otolaryngologists
Caroline Farroll

Poster# ARS108
Predictors of biologic switching in CRSwNP
Beverly Fu, BA, MA

Poster# ARS109
Predictors of odontogenic sinusitis severity
Landon Ebbert, Medical Student

Poster# ARS110
Preoperative hypoalbuminemia and 30-day outcomes after functional endoscopic sinus surgery
Jazlyn Selvasingh, BA

Poster# ARS111
Prognostic outcomes of treatment modalities in esthesioneuroblastoma: Meta-analysis
Srivatsa Surya Vasudevan, MD, MS

Poster# ARS112
Psychiatric events associated with elexacaftor/tezacaftor/ivacaftor use: a pharmacovigilance study
Elena Quinonez Del Cid

Poster# ARS113
Quality-of-life after endoscopic endonasal pituitary surgery
Narin N. Carmel Neiderman, Dr

Poster# ARS114
Radiology education in otolaryngology residency: Current practices and opportunities
Ibtisam Mohammad, MD

Poster# ARS115
RAI outperforms mFI-5: Frailty tools predicting postoperative outcomes in rhinologic surgery
Lauran Evans, MD

Poster# ARS116
Real-world sinus rinse practices in CRS
Teresa Zheng

Poster# ARS117
Recurrence rates of sinonasal inverted papilloma
Evelyn Leland, MD

Poster# ARS118
Refining endoscopic skull base CSF leak repair: What recent evidence shows
Ibtisam Mohammad, MD

Poster# ARS119
Relationship between environmental exposures and sinonasal health
Anna van Dorsten, BS

Poster# ARS120
Repair of the diaphragma sellae: A shift in the transsellar reconstructive paradigm
Mark Liu, MD

Poster# ARS121
Rethinking the role of preoperative imaging in DCR: Lessons from 515 cases
Emma Anisman, BA

Poster# ARS122
RF posterior turbinate nasal neurolysis
Chien Yu Huang, MD

Poster# ARS123
Rhinitis medicamentosa: A comparative analysis of treatment methodologies
Jonathan Raskin, MD

Poster# ARS124
Rhinologic predictors of long COVID (LC)
Natalia Alvarado Ramos, BS

Poster# ARS125
Risk factors for Draf 2B failure in patients with chronic rhinosinusitis with nasal polyps
Vidit Talati, MD, MS

Poster# ARS126
Risk factors for the early postoperative recurrence of allergic fungal rhinosinusitis
Matthew Liu, MD

Poster# ARS127
Risks of epistaxis and chronic rhinosinusitis in oral isotretinoin vs topical retinoid users
Abdulghafoor Alani, BS

Poster# ARS128
Role of elective neck dissection in sinonasal adenoid cystic carcinoma
Rushi Patel, MD

Poster# ARS129
Scalloping of petrous apex on CT as a novel marker for idiopathic intracranial hypertension
Carson Potts, BS

Poster# ARS130
Septal deviation and the eustachian tube: Revisiting the connection
Ibtisam Mohammad, MD

Poster# ARS131
Severe obesity associated with increased CSF leak rate after endoscopic sinus surgery
Jamie Oliver, MD

Poster# ARS132
Sinonasal disease and mental health
Mishek Thapa, BS

Poster# ARS133
Sinonasal mucosal melanoma: A retrospective cohort study
Nathan Barefoot, BS

Poster# ARS134
Sinonasal sarcoidosis: A systematic review
Cali Loblundo, BS

Poster# ARS135
Sleep dysfunction in CRS and quality of life recovery after FESS
Mark Liu, MD

Poster# ARS136
Sleep-related changes following TCRF treatment of NVC
Jordan Pritikin, MD

Poster# ARS137
SLIT-induced changes in allergen reactivity and biomarkers in HDM-allergic rhinitis
Marn Joon Park, MD, PhD

Poster# ARS138
Small business grants awarded by the national institutes of health for rhinologic diseases, 1984-2024
Jack Birkenbeuel,MD, MBA

Poster# ARS139
Smell and taste impairment and ultraprocessed food consumption in a national U.S. sample
Jonathan Hsu, Medical Student

Poster# ARS140
Social determinants of health and olfaction and cognition
Daniel Giles, BS

Poster# ARS141
Socioeconomic determinants of dupilumab prescription and adherence among patients with CRSwNP
Krishna Josyula, BS

Poster# ARS142
Soft-tissue morbidity after rhinoplasty: Meta-analysis of piezoelectric vs conventional osteotomy
Mark Mosaad, BA

Poster# ARS143
Study design and randomization as predictors of dissemination in endoscopic sinus surgery trials
Cameron Hrabak, BS

Poster# ARS144
Suprasellar extension of pituitary tumors and olfactory outcomes after transsphenoidal approach
Margaret Mitchell, MD, MS-HPEd

Poster# ARS145
Systematic review of efficacy and subgroup predictors of biologic and ESS response in CRSwNP
Arun Chakravorty, PhD

Poster# ARS146
The impacts of chronic hyperglycemia and diabetes on endoscopic sinus surgery outcomes
Naveen Raj, BS

Poster# ARS147
The state of AI in rhinology: Gaps in clinical development, risk of bias and reporting
Daniel Lee, MD, FRCSC

Poster# ARS148
WITHDRAWN

Poster# ARS149
Timing of closed nasal reduction in pediatric nasal fractures
Veenadhari Kollipara, BA

Poster# ARS150
Timing of venous sinus stenting in spontaneous CSF leaks
Peter Giannaris, BS

Poster# ARS151
Total intravenous vs inhalation anesthesia in endoscopic sinus surgery: A systematic review and meta-analysis
Peter Benjamin

Poster# ARS152
Trends in sinus surgery following FDA approval of biologics
Joyce Lee

Poster# ARS153
Updated survival and prognostic factors in esthesioneuroblastoma: SEER analysis of 963 patients
Emma Tam, BA

Poster# ARS154
WITHDRAWN

Poster# ARS155
Vaping and incident CRS across adult age groups
Albert Y Li, BA

Poster# ARS156
VivAer: A correlation between symptom scores and objective findings
Auddie Sweis, MD

Poster# ARS157
Wearable data demonstrate improved activity after sinus surgery
Cole Bird, MSCR

Poster# ARS158
Why septoplasty sometimes needs a revision: Looking at recent findings (2020–2025)
Ibtisam Mohammad, MD

Poster# ARS159
WITHDRAWN

Poster# ARS160
Wu-Tang middle turbinate resection classification
Dennis Tang, MD, FA

ORAL PRESENTATIONS

Highlights Section

- 2 days, 1 afternoon breakout session, and 1 morning breakout session
- 71 oral scientific presentations
- 160 poster presentations
- Skull Base and Orbital Surgery Section - Friday evening event
- Women in Rhinology Section - Saturday evening event
- Young Rhinologists Section - Sunday morning breakfast session
- President's Reception
- Panels highlighting:
  - Jeopardy, Rhinology Edition
  - Balloon Dilation, more than twenty years after its introduction, and where it stands today
  - Physician industry partnerships – doing it ethically and successfully
  - Spontaneous CSF leaks and the current standard of care
  - Executive coaching and leadership development
  - The rhinology workforce
  - Advocacy
  - Best bench research
  - International fellowship training

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Friday, April 24, 2026

7:00 am – 12:00 pm
ARS Strategic Planning Meeting
Sheraton, Valley of the Sun B

1:00 pm – 5:00 pm MST
ARS Board of Directors Meeting
Room: Sheraton Hotel, Valley of the Sun C

Saturday, April 25, 2026
General Session
Convention Center, 105 ABC
8:00 am – 5:00 pm MST

8:00 am – 8:05 am
Welcome
Amber Luong, MD, PhD, FARS

Room Moderator: Marc Dubin, MD, FARS

Oral Presentations: Top Basic Science

Session Moderators: Angela Donaldson, MD, FARS, and Arthur Wu, MD, FARS

8:05 am – 8:13 am
PM exposure upregulates endocytic pathways and particle uptake
Amabir Gill, MD
Yiran Li
Marc Hershenson
Johann Gudjonsson
Xinyi Deng
Rachael Bogle
Bangqiao Yin
Apurva Bhangale
Chad Brenner
Christina Years
Jennifer Fox
University of Michigan

Background:
Data suggest that particulate matter (PM) may be a risk factor for chronic rhinosinusitis (CRS) development and symptom exacerbation. Nevertheless, mechanisms linking PM exposure and CRS pathogenesis remain largely unknown.

Methods:
Human nasal epithelial cells (HNECs) obtained from CRS with nasal polyp (CRSwNP; n=3) and control (n=3) ethmoid tissue were cultured at air-liquid interface. After differentiation, HNECs were exposed to 30µg/cm2 of PM<4µm over 72 hours (6 hours on/18 hours off). Transcriptional responses were evaluated using bulk RNA sequencing. Differential gene expression and functional enrichment analyses were performed to delineate PM-induced transcriptional changes. Genes with adjusted $p<0.05$ and fold change >1.5 were considered statistically significant. Intracellular PM particles and vacuoles were quantified by transmission electron microscopy (TEM). Epithelial barrier integrity was quantified by transepithelial resistance (TEER).

Results:
Compared to control HNECs, cells from CRSwNP showed more PM-induced inflammation and tight junction disruption, as evidenced by differential expression of IL1B, IL1A, CXCL8 and OCLN, CLDN10, respectively. There was significant upregulation of endocytosis (RAB3, RAB8, RAB10) and membrane trafficking pathways (ARFRP1, ARF1P) in PM-exposed CRSwNP HNECs. TEM demonstrated greater intracellular particulates and increased vacuoles following PM treatment in CRSwNP vs. controls. CRSwNP cultures showed greater reduction in TEER.

Conclusion:
HNECs from CRSwNP show enhanced PM uptake alongside activation of pro-inflammatory and endocytic trafficking pathway and epithelial barrier dysfunction. These data suggest a mechanism by which PM exposure may drive and/or exacerbate CRS.

8:14 am – 8:22 am
IL-13-induced signaling pathways and chitinase production in human and mouse olfactory stem cells
Paul Cowan, MD
Andrew Lane, MD, FARS
Kristine Sun, Postdoctoral Fellow
Binbin Ma, Postdoctoral Fellow
Haiqing Zhao, Professor of Biology
Johns Hopkins University School of Medicine

Background:
Olfactory dysfunction is common in chronic rhinosinusitis with nasal polyps (CRSwNP) and correlates with type 2 (T2) inflammation. In the olfactory epithelium (OE), horizontal basal cells (HBCs) are quiescent stem cells that activate after injury. We examined how HBCs respond to Interleukin-13 (IL-13) in human-relevant models.

Methods:
In a mouse line with inducible, OE-specific IL-13 expression, single-cell RNA sequencing, pathway analysis, and immunostaining were used to characterize effects on OE cells. Ex vivo, human HBCs were isolated from olfactory brushings (control, CRS, CRSwNP), stimulated with IL-13, and assessed by gene expression analysis and immunostaining.

Results:
In mice, OE IL-13 induced HBC-specific transcriptional programs are linked to apoptosis, JAK–STAT3, and PI3K–AKT signaling, consistent with activation and immune crosstalk. IL-13 robustly upregulated the chitinase-like protein Ym2 (Chi3l4) in HBCs, globose basal cells and sustentacular cells. In human HBCs, IL-13 increased acidic mammalian chitinase (CHIA) mRNA levels, with greater induction in CRS/CRSwNP donors, and was accompanied by NOTCH1 and STAT3 mRNA upregulation. Human CHIA induction echoes mouse Ym2, pointing to a shared chitinase-regulated response in HBCs under T2 conditions.

Conclusions:
Across mouse and human systems, IL-13 stimulates signaling pathways and chitinase-like programs in olfactory HBCs, including murine Ym2 and human CHIA upregulation. These patterns suggest a T2-specific activation of epithelial immune defense function in olfactory stem cells in CRSwNP, potentially sacrificing sensory organ maintenance. In addition, these molecules may serve as candidate biomarkers for CRSwNP-related olfactory dysfunction.

8:23 am – 8:31 am
A novel murine model of upper airway specific type 2 inflammation
Tolani Olonisakin, MD, PhD
Abigail Gaffar
Mengfei Chen
Kristine Sun, Postdoctoral fellow
Admira Parveen
Andrew Lane, MD, FARS
Johns Hopkins Hospital

Background:
Tertiary lymphoid structures (TLS) are present in sinonasal mucosa in chronic rhinosinusitis with nasal polyps (CRSwNP). TLS appear to persist despite dupilumab treatment, implying a potential tissue-intrinsic defect underlying disease recurrence after dupilumab discontinuation. Delineating mechanistic drivers of TLS formation and maintenance may direct complementary therapeutic strategies for CRSwNP. We therefore sought to develop a mouse model that mimics the immune microenvironment in CRSwNP.

Methods:
Sinonasal mucosal tissue obtained from dupilumab-naïve and dupilumab-treated CRSwNP patients was processed for immunohistochemistry (IHC). Transgenic mice inducibly expressing TNF in the nose were generated using the PLUNC (palate, lung, nasal epithelium clone) gene to drive reverse tetracycline transcriptional activator expression, together with a Tet-response element-TNF transgene. Plunc-Tnf mice on a doxycycline-containing diet were challenged with repetitive rounds of intranasal instillation of an allergen cocktail or PBS control for six weeks. Sinonasal tissue was obtained and processed for IHC.

Results:
TLS, as defined by aggregates of CD4+ CD20+ cells were identified in CRSwNP tissue, with persistent enrichment of TLS aggregates even after dupilumab treatment ($p<0.05$). Sinonasal tissue obtained from allergen-exposed Plunc-Tnf mice showed similar lymphoid aggregates suggestive of TLS.

Conclusions:
To mimic unique features of the CRSwNP tissue microenvironment, we generated a transgenic mouse model that enables selective induction of type 2 inflammation in the upper respiratory tract. This model will allow for delineation of direct mechanistic drivers of type 2 TLS formation and maintenance.

8:32 am – 8:40 am

Increased CFTR 5T allele prevalence in refractory CRSwNP

Peter Giannaris, BS
Michael Werner, Resident
Nikki Kumar
Luke Powers
Sarah Van Der Elst
Aron Pollack, Assistant Professor
Mark Chaskes, MD
Charles Tong, MD, FARS
Janice Wang
Blanka Kaplan
Judd Fastenberg, MD
Northwell Health

Background:
The treatment of chronic rhinosinusitis with nasal polyps (CRSwNP) is challenging in refractory cases. Prior studies show that cystic fibrosis transmembrane regulator (CFTR) mutation carriers are more likely to develop CRS and that pathogenic CFTR mutations are more common in CRS than in the general population. However, most studies used panels testing only a small fraction of CFTR variants. With >2000 known CFTR variants, the contribution of CFTR variability to CRS may be underestimated.

Methods:
This retrospective study evaluated patients with treatment-refractory CRSwNP referred to allergy/immunology for atopic disease. CFTR sequencing was performed using a commercial test that sequences all known intronic and exonic variants with 99% sensitivity and specificity.

Results:
CFTR sequencing was performed on 59 refractory CRSwNP patients. Variants were detected in 17 patients (29%), of whom 15 (88%) had at least one pathogenic or likely pathogenic mutation. Notably, 12 (80%) of these were the 5T allele, an intronic region that functions in alternative splicing and skipping of the adjacent exon. The common CF-causing delta F508 mutation was detected in one patient, who also carried 5T and had the only positive sweat chloride test, resulting in re-diagnosis as adult-onset CF and initiation of CFTR modulator therapy.

Conclusion:
CFTR 5T allele variants are highly enriched in refractory CRSwNP (20% vs 3% in genomic studies). These variants are rarely included in CF screening and may be missed by whole-exome sequencing. Their partial penetrance and single-organ effects likely explain the sinonasal-predominant symptoms observed. Targeting this alternative splicing site could improve CRS treatment in many patients with CRS.

8:41 am – 8:49 am

Immune signatures of response to platelet-rich plasma therapy for post-viral olfactory dysfunction

Vivienne Li, BA
Jennifer S. Lee, Medical Student
Arwa Kurabi, PhD
Thomas Zhou, BS
Farhoud Faraji, Resident
Carol H. Yan, MD
University of California, San Diego School of Medicine

Background:
Platelet-rich plasma (PRP) has emerged as a promising therapy for post-viral olfactory dysfunction (PVOD). While clinical improvements have been noted, underlying biological mechanisms are poorly defined. This pilot study evaluated clinical and immune changes in subjects with refractory PVOD treated with PRP.

Methods:
Adults with refractory PVOD ≥6 months underwent a single PRP injection into bilateral olfactory clefts. Demographics, subjective olfactory ratings, and psychophysical testing (UPSIT) were collected at baseline and follow-up. Pre- and post-treatment olfactory cleft mucus samples were analyzed with the Olink Target 48 immune panel. Wilcoxon signed-rank testing assessed paired cytokine changes.

Results:
Eighteen subjects were recruited; 16 completed follow-up. The cohort was 50% female with mean baseline UPSIT of 18 and average duration of smell loss of 39 months. At a mean follow-up of 45 days, 50% had subjective improvement. UPSIT scores improved on average +4.5 pts (SD 5.3), and 60% achieved MCID. Proteomics showed post-PRP upregulation of cytokines involved in early inflammatory signaling and tissue repair: IL-1B (log2 fold change=0.94, p=0.03), CSF2/GM-CSF (0.75, p=0.03), IL-6 (0.66, p=0.03), and CCL8 (0.49, p=0.01). While not significant, IL-33 was downregulated (-1.09, p=0.22).

Conclusion:
Subjects with refractory PVOD demonstrated clinically meaningful olfactory improvement after PRP injection. Accompanying cytokine changes suggest PRP may induce a controlled inflammatory and regenerative response. These preliminary results support biological plausibility of PRP-mediated olfactory recovery and suggest potential biomarkers for future mechanistic and therapeutic studies.

8:50 am – 8:55 AM

Q&A

8:56 am – 9:05 am
Awards Ceremony
Charles Ebert, Jr., MD, FARS; Amber Luong, MD, PhD, FARS; Marc Dubin, MD, FARS

9:05 am – 9:45 am
PANEL: Jeopardy (Rhinology Edition)
Moderator: David Poetker, MD, FARS
Panelists: Omar Ahmed, MD, FARS; Jeremiah Alt, MD, PhD, FARS; Erin O'Brien, MD, FARS; Vijay Ramakrishnan, MD, FARS

9:45 am – 10:15 am
Break with Exhibitors

Oral Presentations: Top Clinical Science

Session Moderators: Jessica Grayson, M; Christopher Ito, MD, FARS

10:15 am – 10:23 am
SNEC and SNUC survival can be predicted by nasal tuft cell markers
Michael Kohanski, MD, PhD, FARS
Ricardo Bruneto, MD
Nikolina Dioufa, MD, PhD
Jennifer Douglas, MD, FARS
Nithin Adappa, MD, FARS
James Palmer, MD, FARS
Noam Cohen, MD, PhD, FARS
Perelman School of Medicine at the University of Pennsylvania

Background:
Sinonasal neuroendocrine (SNEC) and undifferentiated (SNUC) carcinomas are rare aggressive malignancies with no known prognostic markers. These tumors can have overlapping neuroendocrine features making their distinction complex. Hallmarks of Pou2f3+ small cell lung carcinomas were identified in SNECs and SNUCs. Pou2f3 is the transcription factor for tuft cells and Kit was recently identified as a tuft progenitor marker. Here we evaluated Kit and Pou2f3 immunostaining to assess if SNECs/SNUCs are tuft cell lineage carcinomas.

Methods:
Retrospective study of patients with rare sinonasal malignancies treated between 2010–2025 at a single institution with archived tissue for immunohistochemical analysis. Clinical, radiological, and treatment data were collected. Analysis included Kaplan–Meier curves for overall survival (OS), disease-free survival (DFS) and univariate Cox regression.

Results:
Kit+ staining was observed in 90.2% of SNECs (N=11) and 54.6% of SNUCs (N=11). Kit+Pou2f3+ was observed in 72.7% of SNECs and 18.2% of SNUCs. The Kit+Pou2f3+ cohort had significantly improved OS (p=0.003; 1 death) and DFS (p = 0.001, no recurrences) compared to the Kit+Pou2f3- [OS (14 months; 95% CI: 4–21); DFS (10 months; 95% CI: 7–37)] and Kit-Pou2f3- cohorts [OS (36.5 months; 95% CI: 2–50); DFS (12.5 months; 95% CI: 3–not estimable)]. Univariate analysis confirmed decreased OS in Kit+Pou2f3- and Kit-Pou2f3- (HR = 12.24; 95% CI: 1.53–97.4; p = 0.017).

Conclusion:
Results suggest that a subgroup of SNECs and SNUCs are tuft cell lineage carcinomas implying rare cell types give rise to rare tumors. Kit+Pou2f3+ SNECS and SNUCs have markedly improved OS and DFS suggesting these markers may have diagnostic and prognostic utility.

10:24 am – 10:32 am
Laser posterior nasal neurolysis RCT
Chien Yu Huang, MD
Jyun-Yi Liao
En-Ying Wang

Background:
To determine the safety and efficacy of laser ablation of the posterior nasal nerve (PNN) area for the treatment of chronic rhinitis.

Methods:
This study was a single-center, prospective, single-blinded, 2:1 randomized sham-controlled trial. Patients with a 24-hour reflective Total Nasal Symptom Score (rTNSS)□5, rhinorrhea≧2 and congestion≧1, were randomized 2:1 to active treatment of the bilateral PNN area with a CO2 laser device or a sham procedure, with near-zero energy delivery. Patient-reported outcome measures included the rTNSS, Nasal Obstruction Symptom Evaluation (NOSE), Pittsburgh Sleep Quality Index (PSQI), and Epworth Sleepiness Scale (ESS). The primary endpoint was responder rate at 3 months, where a response was defined as ≧50% improvement (decrease) in rTNSS from baseline.

Results:
Patients had a mean baseline rTNSS of 8.5 (95% CI, 7.9-9.1) and 8.2 (95% CI, 7.4-9.0) (P = 0.797) in the active treatment (n = 43) and sham control (n = 22) arms, respectively. At 3 months, responder rate was significantly higher in the active treatment arm: 65.1% (95% CI, 50.3%-80.0%) vs 31.8% (95% CI, 10.7%-53.0%) (P = 0.011). The active treatment arm had a significantly greater decrease in rTNSS (mean, -4.7 [95% CI, -5.5 to -3.9] vs -2.6 [95% CI, -3.5 to -1.7]) (P = 0.001). There were greater improvements in the NOSE, PSQI, and ESS scores for the active arm over the sham arm at the 3-month follow-up. (p=0.3, 0.041, and 0.005, respectively) Three adverse events related to the procedure were reported, and all resolved.

Conclusion:
The CO2 laser posterior nasal neurolysis of the PNN area is associated with minimal adverse events and is superior to a sham procedure in reducing the symptom burden of chronic rhinitis.

10:33 am – 10:41 am
Validation of an allergic rhinitis instrument which synergizes with the sino-nasal outcome test
Selena Zhang
Jennifer Shin, MD, SM
Sapideh Gilani
Zhou Allen, MD
Anthony Prince, Dr
C. Eduardo Corrales

Background:
Allergic rhinitis (AR) and chronic rhinosinusitis (CRS) may interact, e.g. via Type 2 disease, creating a need to evaluate both concurrently yet independently. Currently validated tools, however, require >45 questions and/or repeat query content. We assessed whether an AR-specific instrument, which has synergy with the Sino-Nasal Outcome Test (SNOT-22/26/29), is valid for clinical care and research.

Methods:
Patients who prospectively completed the proposed AR-specific and SNOT instrument variations, the Mini-Rhinoconjunctivitis Quality of Life Questionnaire (MiniRQLQ), and a general health assessment were eligible. 3,566 responses were evaluated via factor analysis and 598 patients had allergy testing. Patients with positive and negative allergy tests were evaluated for discriminant validity. Regression with MiniRQLQ and PROMIS scores measured convergent validity. Intra-rater reliability was evaluated with Cohen kappa and Spearman rho, and responsiveness to change was quantified.

Results:
The AR-specific test supported concurrent, independent evaluation of AR and CRS with 26 questions (instead of 46 from SNOT-22+MiniRQLQ) and no repetition (SNOT-22+RCAT repeats query content). The AR instrument discriminated between patients with positive or negative allergy tests (difference in means 1.22 [95%CI 0.36-2.09]). Supporting convergence with MiniRQLQ (Spearman rho 0.346-0.736) and PROMIS (Spearman rho -0.118 to -0.264) were seen. Intra-rater reliability (Cohen kappa 0.802-0.829; Spearman rho 0.918-0.935) and responsiveness to change (difference in means -0.28 [-0.52 to -0.05]) were demonstrated.

Conclusions:
This synergistic approach offers a novel, concise, efficient, validated method to assess AR and CRS.

10:42 am – 10:50 am
Uninterrupted CPAP use after anterior skull base surgery – A prospective study
Syed Omar Ali, MD
Kaitlyn Madden, BA
Rebecca Ng, MD
Christopher Long, MD
David Poetker, MD, FARS
Stephanie Cheok, MD
Nathan Zwagerman, MD
Lauren North, MD
Medical College of Wisconsin

Background:
Continuous positive airway pressure (CPAP) is an established therapy for OSA. Yet, there is limited literature about the safety of CPAP use after endoscopic skull base surgery (ESBS). This is a proof-of-concept prospective study to evaluate the safety of uninterrupted CPAP use after ESBS.

Methods:
Subjects undergoing standard ESBS with an established diagnosis of OSA and CPAP use were recruited. Post-operatively, they were admitted to the neurosurgery step-down unit for 24-48 hours and allowed to use their personal CPAP machine with prescribed settings on POD 0. Neuro checks every 4 hours and a CT of the head on POD 1 were obtained to monitor safety of CPAP use.

Results:
27 subjects were enrolled. Median age was 57 years (range 26-80), mean AHI was 33.8 (range 3.9 – 70.5), and median BMI was 36.6 (range 24.5 – 56.6). Mean tumor size was 15.9 mm (range 3 – 33 mm). 24 (89%) patients underwent primary surgery while 3 (11%) were revisions. 6 (22%) had intra-operative CSF leak. 25 (93%) subjects had reconstruction with mucosal graft, 3 (11%) had inlay dural substitute placed, 1 (4%) had other synthetic material. All received absorbable nasal packing; 1 (4%) had additional non-absorbable packing, and 1 (4%) had gel foam closure. 17 (63.0%) subjects tolerated CPAP post-operatively, 8 (29.6%) did not tolerate CPAP, and 2 subjects (7.4%) did not use CPAP. Reasons for CPAP intolerance were discomfort or nasal congestion, when documented. POD1 CT of head was completed for 26 (96.3%) subjects. There were no cases of pneumocephalus, delayed post-op CSF leak, or infection.

Conclusion:
Uninterrupted CPAP therapy following ESBS appears safe without increased incidence of CSF leak or pneumocephalus.

10:51 am – 10:59 am
AI-driven SNOT-22 analysis predicts rhinology surgical candidacy in 35,000+ patients
Michael Sramek, MD
Nitish Kumar, MBBS, MS
Shrinath Patel, MS
Amar Miglani, MD
Michael Marino, MD, FARS
Devyani Lal, MD, FARS
Mayo Clinic

Background:
Access to rhinologic care is often limited, delaying treatment for complex sinonasal disease. Patients with non-surgical conditions that mimic rhinologic symptoms, such as migraine, are also referred to rhinologists, increasing costs and contributing to delays. We hypothesized that a machine learning model using SNOT-22 responses may identify patients likely to undergo rhinologic surgery, improving scheduling for surgical candidates while triaging non-surgical patients to neurology, allergy, or sleep medicine.

Methods:
Four algorithms (logistic regression, random forest, XGBoost, and TabNet) were trained on initial SNOT-22 responses from patients seen between 2018 and 2025 within a multisite healthcare system. Models used five-fold cross-validation and held-out test sets. Site-specific and pooled models were created to assess regional variation.

Results:
Of 35,170 patients, 7,309 (20.8 %) underwent rhinologic surgery. Surgical yield ranged from 11.4 % in primary care to more than 20 % in tertiary centers. XGBoost performed best with an AUC of 0.71 to 0.72 across sites, compared with 0.60 - 0.66 for other algorithms. At the optimal threshold, sensitivity was 61%, specificity was 71%, and negative predictive value of 0.91. Features associated with surgery included: nasal obstruction, facial pain or pressure, cough, ear fullness, and female sex. Performance was consistent across sites.

Conclusion:
In the largest study of its kind, SNOT-22 responses enabled a model with moderate predictive power for surgical candidacy and a high negative predictive value for non-surgical patients. This tool could support scheduling workflows, expedite access to appropriate specialties, reduce costs, and improve resource utilization.

11:00 am – 11:05 am
Q&A

11:05 am – 11:55 am
Panel: Balloon Dilation 20+ Years Later: Data, Misconceptions, and Appropriate Use
Moderator: Kristine Smith, MD, FARS
Panelists: Seth Brown, MD, FARS; Nyssa Farrell, MD; Thomas Higgins, MD, FARS; Jay Piccirillo, MD;

11:55 am – 12:00 pm
Q&A

12:00 pm – 1:00 pm
Lunch with Exhibitors

Room Moderator: Greg Davis, MD, FARS

Session Moderators: Victoria Lee, MD, FARS; *Kibwei McKinney, MD*

1:00 pm – 1:06 pm
Biologics impact the volume of endoscopic sinus surgery and referral patterns
Daniel Lee, MD, FRCSC
Donna Plett
Mandolin Bartling
Yvonne Chan, MD, FARS
John Lee, Associate
Lyn Sibley
University of Toronto

Background:
Biologic therapies for chronic rhinosinusitis with nasal polyps (CRSwNP) may reduce the need for revision endoscopic sinus surgery (ESS). This study characterizes changes in ESS volumes and referral patterns in Ontario, Canada, following the introduction of biologics.

Methods:
A population-based retrospective cohort study was conducted using Ontario administrative data from 2017 to 2024. Segmented linear regression was used to analyze monthly volumes, comparing pre-biologic (2017–2019) and post-biologic (2022–2024) trends while excluding active pandemic years to isolate the biologic signal from systemic recovery.

Results:
Among 17,873 patients, annual revision ESS volume declined 22.9% (p=0.04) in the post-biologic period. Time-series modeling revealed a permanent volume reset. While aggregate Complete ESS volume demonstrated a significant positive recovery trend (+0.73 cases/month, p=0.02), the Complete Revision ESS subset showed no significant recovery slope (p=0.80), confirming a “”blunted recovery”” specific to revision cases. Tertiary rhinologist referrals declined 27.9%, while Otolaryngology-to-Respirology/Allergy referrals increased 42.9% (p=0.01). Socioeconomic analysis indicated the proportion of low-income patients undergoing complete revision ESS increased by 22.2% (p=0.03).

Conclusion:
The introduction of biologics is associated with a sustained reduction in revision ESS volume. The lack of surgical volume recovery for revision cases—despite data showing the system had the capacity to recover volume for extensive procedures—suggests a reduced demand for salvage intervention. Rising cross-specialty referrals confirm a shift toward multidisciplinary care.

1:07 pm – 1:13 pm
Cost-effectiveness of ESS versus biologics for chronic rhinosinusitis with nasal polyps
Jerry Hadi Juratli, BS
Beverly Fu
Itzel Rubio-Jimenez, Ms
Michael Chang, MD
Jayakar Nayak, MD, PhD
Zara Patel, MD, FARS
Noel Ayoub, MD
Stanford University

Introduction:
Biologic therapies have expanded the treatment landscape for medically refractory chronic rhinosinusitis with nasal polyps (CRSwNP). This study conducted head-to-head cost-utility analysis of endoscopic sinus surgery (ESS) versus each FDA-approved biologic, modeling real-world clinical pathways including bidirectional treatment escalation, biologic switching, and salvage surgery.

Methods:
A hybrid decision tree-Markov state-transition model was constructed from a societal perspective with real-world treatment pathways. Transition probabilities were derived from a retrospective review of 400 CRSwNP patients at a tertiary rhinology center. Health utilities were derived via validated SNOT-22 to EQ-5D mapping. Costs were literature-sourced and discounted at 3% over a 40-year time horizon with 12-month cycles. Probabilistic sensitivity analysis was performed via 100,000 Monte Carlo simulations against a $50,000/QALY willingness-to-pay threshold.

Results:
ESS demonstrated absolute dominance over all biologic strategies, generating superior QALYs at lower cost. ESS yielded 1.00 QALY at $10,050 versus dupilumab (0.91 QALY; $22,814), mepolizumab (0.87 QALY; $28,175), and omalizumab (0.87 QALY; $16,733). Incremental costs ranged from $6,683 to $18,126 with 0.10-0.13 QALY decrements. Net monetary benefit analysis confirmed ESS superiority across all comparators. Threshold analysis identified $8,376 as the annual price point at which omalizumab achieves cost-effectiveness parity.

Conclusion:
ESS dominates all FDA-approved biologics as first-line therapy for medically refractory CRSwNP when modeling treatment escalation. Biologic cost-effectiveness requires substantial price reductions from current levels.

1:14 pm – 1:20 pm
Comparative outcomes of biologics versus surgery for CRSwNP in real-world practice
Omer Baker, BS
Bita Naimi, Resident Physician
Adam DeConde, MD
Carol H. Yan, MD
UC San Diego Health

Introduction:
Biologics improve sinonasal symptoms in chronic rhinosinusitis (CRS), yet long-term real-world data on biologic switching, treatment durability, and need for additional therapies remain limited. This study compares longitudinal outcomes of biologics versus functional endoscopic sinus surgery (FESS) in a national dataset.

Methods:
Using Epic Cosmos, we identified CRS patients with encounters from June 2019-December 2024. Patients initiating a biologic (dupilumab, omalizumab, or mepolizumab) or undergoing FESS were included. Asthma was not excluded due to its high comorbidity with CRS. Outcomes at 6, 12, 24, and 36 months included biologic switching, FESS after biologic initiation, repeat FESS, and oral corticosteroid (OCS) bursts. Rates were compared across treatment groups.

Results:
Among 3.86 million CRS patients included, biologics were used less frequently (1.2%) than FESS (3.7%). While omalizumab, mepolizumab, and FESS volumes remained stable, dupilumab use increased annually. Asthma was the strongest identified predictor of biologic initiation (RR 8.9) and adults aged 40-59 had threefold higher likelihood of biologic use compared to those <30. At 36 months, FESS rates after biologic initiation were lowest with dupilumab (8.1%) versus omalizumab (8.8%) and mepolizumab (12.2%). Dupilumab also had the lowest switching rates (6.3% vs. 24-31%) and OCS bursts (72% vs 84-86%). Among patients who underwent FESS initially, 5.5% later started a biologic, 5.4% required repeat FESS, and 50.6% required an OCS burst within three years.

Conclusion:
In this large real-world cohort, dupilumab demonstrated the most durable outcomes among biologics, while FESS had the lowest cumulative need for subsequent interventions.

1:21 pm – 1:27 pm
Are we operating less on CRSwNP in the biologics era?
Samuel Kaefer, MD
Harsh Duvvuru
Stephanie Smith, MD
Robert Kern, MD, FARS
Brent Senior, MD, FARS
Vijay Ramakrishnan, MD, FARS
Indiana University School of Medicine

Objective:
To evaluate changes in rates of endoscopic sinus surgery (ESS) in chronic rhinosinusitis with nasal polyps (CRSwNP) in the biologics era.

Background:
In the U.S., the treatment paradigm for CRSwNP remains open, where any patient may elect for treatment with surgery, biologics, or some combination of both. Limited real-world data exist to illustrate changes in surgery utilization since the introduction of biologics for CRSwNP.

Methods:
We performed a claims-based study to analyze trends in CRSwNP management utilizing data from the Merative™ MarketScan® Research database from 2016-2023, encircling the 2019 FDA approval of dupilumab given that it is the current market leader. We analyzed temporal trends in treatment rates for CRSwNP using multiple statistical methods.

Results:
From 2016–2023, the MarketScan® database contained data on 20,652,098
commercially insured patients (on average) per year. Among these, 469,210 patients carried a diagnosis of CRS, and 68,173 met criteria for CRSwNP per year. The rate of ESS in CRSwNP patients decreased by approximately 5.8 per 1,000 per calendar year ($R2 = 0.52$, $p < 0.05$), whereas the biologic initiation rate in CRSwNP patients increased by approximately 1.82 per 1,000 per calendar year ($R2 = 0.89$, $p < 0.05$). Interestingly, ESS rates for overall CRS were largely unchanged during this time.

Conclusions:
Our study quantifies the growth of biologics in CRSwNP treatment, and the concomitant decrease in surgical volume. These data are useful to inform CRSwNP market dynamics for research innovation, understanding of real-world biologics use, individual and system-level cost considerations, and benchmark implications for treatment paradigm changes moving forward.

1:28 pm – 1:34 pm
The utilization of the completeness of surgery index in revision ESS patients on biologic therapy
Margaret Mitchell, MD, MS-HPEd
Isha Thapar, BA
Saawan Patel, Medical Student
Jennifer Douglas, MD, FARS
Michael Kohanski, MD, FARS
Nithin Adappa, MD, FARS
James Palmer, MD, FARS
Alan Workman, MD
Perelman School of Medicine at the University of Pennsylvania

Background:
Surgical completeness is a key determinant of postoperative outcomes in CRS. The Completion of Surgery Index (CoSI) score has emerged as a standardized measure to assess the adequacy of surgical intervention and need for revision surgery. The utility of CoSI in patients concurrently treated with biologic therapy, especially those undergoing revision FESS, has not yet been explored.

Methods:
We conducted a retrospective analysis of CRSwNP patients who received revision endoscopic sinus surgery at two academic institutions between 2019 and 2023 who were also prescribed a biologic therapy during this period. Patient records were reviewed for patient demographics, timing of biologic treatment, and pre- and post-operative SNOT-22 scores.

Results:
Our cohort comprises 63 revision surgery CRSwNP patients with a median age of 45 years, with 31 on biologic therapy preoperatively, and 32 placed on biologics after surgery. Patients on preoperative biologics demonstrated a statistically significant postsurgical reduction in SNOT-22 scores over a period of 6 to 24 months (-27.4 ± 23.3, $p<0.0001$), consistent with previously reported improvements in patients not on biologics. Among patients on preoperative biologics, a lower preoperative CoSI score (previously incomplete surgery) was associated with significantly greater improvement in SNOT-22 scores from 6 months to 2 years postoperatively.

Conclusion:
Surgery in patients already on biologic therapy resulted in significant improvement in SNOT-22 scores over 2 years. Lower preoperative CoSI scores were associated with significantly greater long-term improvement in SNOT-22 after revision surgery in patients on biologics, supporting the benefit of complete surgery in these patients.

1:35 pm – 1:40 pm
Q&A

1:41 pm – 2:11 pm
Panel: Physician-Industry Partnerships: Doing it Ethically & Successfully in Private Practice and Academia
Moderator: Greg Davis, MD, FARS
Panelists: Martin Citardi, MD, FARS; David Conley, MD, FARS; Cecelia Damask, DO; Randall Ow, MD, FARS

Session Moderators: Do-Yeon Cho, MD; Corinna Levine, MD, FARS

2:12 pm – 2:18 pm
Venous thromboembolism and bleeding in endoscopic skull base surgery: Impact of postoperative anticoagulation and caprini score
Noam Koch, MD

Background:
Postoperative venous thromboembolism (VTE) and bleeding (nasal and intracranial) are possible complications of endoscopic sinonasal cancer surgery (ESCS) or endoscopic skull-base surgery (ESBS). Thus, presenting a dilemma regarding the risk and benefit of prophylactic anticoagulation. Currently, the data in the literature is scarce. In this study we aimed to assess the risk of VTE and bleeding in patients undergoing ESCS and ESBS who either received or not prophylactic anticoagulation and evaluate the utility of the Caprini (VTE risk) score.

Methods:
All patients who underwent ESCS or ESBS between 2015- 2025 in our institution. Caprini scores were calculated, and patients were classified as low (0–4), moderate (5–7) or high (≥8) risk. Use of postoperative anticoagulation was evaluated. Primary outcomes were VTE, major bleeding (intranasal or intracranial) within 30 days of surgery.

Results:
374 patients were identified. Anticoagulation was administered to 48 patients (13%). Five patients developed VTE - 2/159 low-risk (1.2%), 2/192 moderate-risk (1%), 1/23 high-risk (4.3%). Two of these patients received anticoagulation, one from the high-risk group and one from the low-risk group. Thirteen patients experienced major bleeding. Three patients had nasal bleeding (1/159 low-risk, 2/192 moderate-risk), and ten intracranial hemorrhages (2/159 low-risk, 7/192 moderate-risk, 1/23 high-risk) with four of these patients receiving anticoagulation.

Conclusions:
VTE and bleeding events were rare, and some occurred at a similar rate regardless of anticoagulation prophylaxis. These findings raise doubts concerning the utility of Caprini-guided anticoagulation for ESCS/ESBS and support developing procedure-specific risk models.

2:19 pm – 2:25 pm
Cost-utility of GLP-1 receptor agonists in idiopathic intracranial hypertension
Joanna Lin, BA
Noel Ayoub, MD
Stanford University

Background:
Glucagon-like peptide receptor agonists (GLP-1RAs) have emerged as a promising treatment for idiopathic intracranial hypertension (IIH) and may reduce spontaneous CSF leak risk. However, the cost-utility of prophylactic GLP-1RA therapy compared to standard medical management remains unknown. This study evaluates the cost-utility of prophylactic GLP-1RA therapy versus standard of care for IIH in the US healthcare setting.

Methods:
A cost-utility analysis using a hybrid decision tree-Markov model with probabilistic sensitivity analysis was constructed to compare GLP-1RA prophylaxis versus standard care (weight management plus acetazolamide) over a 5-year horizon from a US healthcare system perspective. Model parameters, including costs, health utilities, and patient outcomes were derived from published data. Monte Carlo simulation with 100,000 iterations was used to address uncertainty. Costs and outcomes were discounted at 3% annually. Cost-utility was evaluated at a $50,000/QALY willingness-to-pay threshold.

Results:
GLP-1RA therapy was associated with higher costs ($79,839 vs $45,477) and modestly greater effectiveness (2.09 vs 1.91 QALYs), yielding an incremental cost-utility ratio of $190,900/QALY. Medication costs were the primary driver ($78,300 vs $39,200), and avoided surgical complications did not offset pharmaceutical expenditures. Net monetary benefit analysis confirmed standard care dominated GLP-1RA ($50,262 vs $24,582).

Conclusion:
Prophylactic GLP-1RA is not cost-effective for IIH patients at current pricing given modest benefits and high medication costs. Standard medical care with weight management and acetazolamide remains the preferred first-line strategy from a cost-utility perspective.

2:26 pm – 2:32 pm
Quality-of-life outcomes following endoscopic transsphenoidal surgery: A multi-center analysis
Jack Olmstead, PhD
Vivienne Li
Thomas Beaumont, MD, PhD
Adam DeConde, MD
Carol H. Yan, MD

Background:
The endoscopic endonasal approach (EEA) is the standard technique for pituitary and sellar tumor resection, but manipulation of the sinonasal corridor and pituitary gland may lead to postoperative sinonasal and endocrine morbidity affecting long-term quality of life (QoL). This study characterized the incidence and timing of these sequelae after EEA.

Methods:
Using EPIC Cosmos, we identified patients undergoing EEA (CPT 62165) from 2014–2024. Individuals with preexisting sinonasal or endocrine conditions were excluded. Incidences of postoperative sinusitis, olfactory dysfunction, endocrinopathies, and new hormone replacement prescriptions were assessed across intervals up to 36 months.

Results:
Among 9,286 eligible patients, 24.8% developed sinusitis within 24 months, most commonly in the first 2 months (15.7%); with only 2.4% requiring functional endoscopic sinus surgery. The 1-year incidence of new olfactory dysfunction was 2.5%. Endocrinopathies occurred early: diabetes insipidus (8.4%) and SIADH (3.4%) peaked at 0-2 months and fell to <1% beyond 12 months. Hormone replacement prescriptions had similar temporal clustering—hydrocortisone, thyroid hormone, desmopressin, and prednisone peaked early (0–2 months), whereas sex- and growth-hormone replacement occurred later (3–6 months). Late-onset new hormone initiation was uncommon (<3%).

Conclusion:
In this large national cohort, sinonasal and endocrine sequalae after EEA occurred predominantly in the early postoperative period and decreased substantially over time. These findings support early multidisciplinary surveillance to identify reversible deficits and optimize long-term QoL outcomes following pituitary and sellar tumor surgery.

2:33 pm – 2:39 pm
Incidence and management of mucoceles following open skull base surgery
Ran Bilaus, MD
Narin N. Carmel-Neiderman, Dr
Tel-Aviv Sourasky Medical Center – Ichilov

Introduction:
Open skull base surgery is a multidisciplinary approach used to manage complex sinonasal and cranial pathologies. These procedures carry risks, including delayed mucocele formation, which may lead to significant morbidity. Defining the incidence, presentation, and contributing factors is essential for long-term postoperative care.

Aims:
To determine the incidence and risk factors for mucocele formation following open skull base surgery.

Methods:
A retrospective cohort study of patients who underwent open skull base surgery at our center. Data included demographics, surgical approach, underlying pathology, reconstruction method, time to mucocele diagnosis, symptomatic versus incidental detection, and need for additional surgery. Regression analysis was performed to identify predictors of mucocele formation.

Results:
Among 145 patients, 27 (18.6%) developed postoperative mucoceles. The cohort had a median follow-up of 14.2 years. Initial indications included trauma, CSF leaks, and neoplasms. At diagnosis, 22 patients (84.6%) were symptomatic, most commonly with headache, swelling, or visual changes; the remainder were detected incidentally. The mean interval from primary surgery to mucocele identification was 8.47±3.72 years. Surgical treatment of the mucocele was required in 19 patients. Risk factors included younger age at initial surgery, comorbidities, prior chemotherapy or radiation, head trauma, and primary pathologies involving the ethmoid or periorbital regions.

Conclusions:
Mucoceles are a significant delayed complication of open skull base surgery, often presenting many years after surgery. A prolonged follow up, and identification of risk factors is essential for prompt diagnosis and early treatment.

2:40 pm – 2:46 pm
Clinical outcomes of oligometastatic nasopharyngeal carcinoma
Abdulghafoor Alani, BS
Emma Anisman
Daniel Uralov, MD
Marc Rosen, MD, FARS
Mindy Rabinowitz, MD, FARS
Elina Toskala, MD, PhD, FARS
Gurston Nyquist, MD, FARS

The oligometastatic state describes a limited metastatic burden with potential for prolonged survival using aggressive local therapy. While prospective studies from endemic Asian regions support this paradigm in nasopharyngeal carcinoma (NPC), its applicability to Western populations, which have distinct histologic and viral profiles, remains poorly defined.

A retrospective review identified NPC patients treated from 2004–2025 with <5 radiographically or pathologically confirmed metastatic sites. Demographic, pathologic, and treatment variables were collected. Overall survival (OS) was calculated from diagnosis. Outcomes were stratified by metastatic site, metastasis-directed therapy (MDT), immunotherapy use, and WHO subtype.

Fourteen patients met criteria (mean age 60.6 years; 64% male; 71% EBV-positive). Lung (n=6), bone (n=3), and liver (n=3) were the most common metastatic sites. Median OS was 29.1 months (1-, 3-, 5-year OS: 78.6%, 35.7%, 14.3%). Distant nodal metastases demonstrated the longest median OS (50.9 months), while liver metastases had the poorest (21.9 months). MDT conferred longer survival than systemic therapy alone (31.7 vs 18.1 months). Median OS by WHO subtype was 31.7 months (III), 15.4 months (II), and 26.6 months (I). No factor reached statistical significance on univariate analysis, though never-smokers trended toward improved OS (p=0.057).

This first Western single-institution series dedicated to oligometastatic NPC demonstrates that selected patients achieve durable survival with aggressive multimodal therapy. The survival advantage observed with MDT supports expanding curative-intent approaches in non-endemic populations and underscores the need for prospective validation.

2:47 pm – 2:55 pm
Q&A

2:56 pm – 3:29 pm
Break with Exhibitors

Session Moderators: Karen Bednarski, MD, FARS; Kibwei McKinney, MD

3:30 pm – 3:36 pm
A pilot evaluation of a novel fluid evacuation device in endoscopic sinonasal surgery
Corinne Stonebraker, BA
Megan Christy, BSE
Abdelrahman Ahmed, MS
Flavia Bottai
Turner Baker, PhD
Lacy Brame, DO
Aisosa Omorogbe, MD
Raj Shrivastava, MD
Alfred-Marc Iloreta, MD
Icahn School of Medicine at Mount Sinai

Background:
Maintaining hemostasis and adequate visualization during endoscopic sinus surgery remains a rate-limiting challenge, requiring frequent handheld suctioning and disrupting workflow. Additionally, biofluid migration into the oropharynx increases aspiration risk and contributes to postoperative nausea and vomiting. Here we present an occlusive nasopharyngeal suction prototype (NSP) to hermetically seal the nasopharynx and provide continuous evacuation to reduce posterior blood migration and improve surgical workflow.

Methods:
A 3D-printed endonasal model with anatomically relevant injection ports was placed in surgical orientation and connected to a suction circuit (15 L/min) incorporating the prototype. Thirty milliliters of simulant blood and fragmented gelatin were injected over six seconds. Endoscopic recordings documented flow and leakage. Retained nasal blood and migrated oral blood volumes were measured. Blood volumes and clearance time during NSP use were compared to a control without continuous suction.

Results:
NSP use significantly reduced retained nasal blood (1.4±0.6cc vs. 5.8±3.2cc; p=0.03) and eliminated oral cavity migration (0.0±0.0cc vs. 21.8±2.6cc; p=0.0001). Clearance time was shorter with NSP (1.7±0.74s) than control (11.4±3.8s; p=0.0063). No clogging or leakage of the NSP occurred, and endoscopy confirmed continuous posterior suction.

Conclusion:
The NSP significantly reduced posterior blood migration and accelerated blood clearance in simulated endoscopic sinonasal surgery. These findings support further testing of the NSP in live surgical settings as a practical approach to enhance surgical efficiency and reduce aspiration risk and post-operative nausea and vomiting.

3:37 pm – 3:43 pm
Wearable technology: Is the future of in-office medical interpretation here?
Emma Anisman, BA
Laura Palacio Morales, Medical Student
Yanmin Qu, Medical Student
Chang Liu
Shin Heng Teresa Chan, Medical Student
Agustina Arce
Benjamin Bitner, MD
Elina Toskala, MD, PhD, FARS
Marc Rosen, MD, FARS
Gurston Nyquist, MD, FARS
Mindy Rabinowitz, MD, FARS

Intro:
Language barriers pose significant challenges for medical encounters, requiring the use of medically literate translators who are not always available and can prolong visit times. This study evaluates new wearable translation devices to improve access to and efficiency of medical translation in outpatient settings.

Methods:
Both a standardized clinician and patient used translation devices (Ray-Ban Meta AI glasses or Apple AirPods 3) to perform scripted simulated encounters. Spanish and Mandarin Chinese (AirPods only) were assessed. Translations were evaluated by the clinician and patient on a 5-point scale (5 indicating best performance) for fluency, adequacy, meaning, and error severity.

Results:
In Spanish, mean scores for AirPods were: fluency 4.95, adequacy 4.84, meaning 4.81, severity 4.88. Means for Meta were 4.72, 4.79, 4.72 and 4.88 respectively. AirPods performed better in fluency ($p=0.003$) and adequacy ($p=0.007$), and similarly to Meta in error severity ($p=0.064$). In Mandarin, AirPods performed similarly to Spanish in fluency ($p=0.12$) and severity ($p=0.064$), and worse in adequacy ($p=0.0013$) and meaning ($p=0.024$). In Spanish, Meta saved 88 and AirPods saved 151 seconds per 10-minute encounter with a live translator. AirPods saved 54 seconds in Mandarin. In Spanish, AirPods made two clinically significant errors (severity 1-3), while Meta made one. In Mandarin, AirPods made 6 significant errors per encounter.

Conclusions:
Wearable technology may revolutionize medical translation. In this study, AirPods were superior to Meta glasses, with best performance in Spanish. The technology cannot yet safely replace interpreters. However, wearable technology may soon play a role, allowing for quicker, real-time translation.

3:44 pm – 3:50 pm
WITHDRAWN

3:51 pm – 3:57 pm
AI-assisted pill identification to improve medication reconciliation in ENT clinics
Mannut Singh
Tyler Ostrowski, Dr
Ava Herzog
Adrian Joesph
Anthony Saad, Medical Student
Jean Anderson Eloy, MD, FARS
Jordan Grube, DO

Objective:
To evaluate the feasibility and clinical utility of convolutional neural networks (CNNs) for automated pill identification in ENT practice as a tool to enhance medication reconciliation accuracy.

Methods:
A curated dataset of pill images representing five commonly used antihistamines—Allegra (fexofenadine), Benadryl (diphenhydramine), Claritin (loratadine), Xyzal (levocetirizine), and Zyrtec (cetirizine)—was assembled from public sources and divided into training (75%) and validation (25%) subsets. Images were standardized (224×224 pixels), normalized, and augmented through random rotations, flips, and color jittering. A ResNet-18 CNN pretrained on ImageNet was fine-tuned for multi-class classification using Adam optimization over 30 epochs. Model performance was assessed via sensitivity, specificity, precision, F1-score, accuracy, and confusion matrix analysis.

Results:
The CNN achieved high overall performance across all classes, with average sensitivity and specificity exceeding 95%. Classification was perfect for Allegra, Benadryl, Claritin, and Xyzal, while limited misclassification occurred in the Zyrtec class ($F1 = 0.91$, accuracy = 0.83). Training curves demonstrated effective learning despite a modest dataset size.

Conclusion:
CNN-based pill identification demonstrates strong potential to augment medication reconciliation in clinics by accurately distinguishing commonly used antihistamines. Misclassification confined to a single class underscores the need for expanded datasets and real-world validation. Integration of AI-assisted pill recognition into clinical workflows and electronic medical records could substantially reduce reconciliation errors, enhance patient safety, and streamline care.

3:58 pm – 4:04 pm
6-month outcomes of sinus dilation with a paclitaxel-coated balloon for treatment of recurrent CRS
Fabio Vega, MD
Sabrina Zapata, MD
Coral Benitez
Sanatorio Americano
Nestor Cardozo
Theodore Truitt
CSS

Introduction/Purpose:
A paclitaxel-coated balloon is designed for mechanical sinus dilation and local drug effect to mitigate cell hyperplasia. This study was designed to evaluate safety and potential efficacy of the Airiver Sinus DCB in the treatment of CRS with or without nasal polyps (CRSwNP or CRSsNP).

Methods:
This was a prospective, multicenter, single-arm, open-label, first-in-human study. The primary safety endpoint was freedom from major device-related adverse events (MADE) through 30 days post index procedure. Treatment included endoscopic sinus surgery (ESS) followed by DCB dilation of the treated sinuses and resected ethmoid cavities. Polyps were surgically removed prior to DCB dilation. The primary efficacy endpoint was freedom from reintervention through 6 months. Symptoms and quality of life were evaluated and 6-month results are reported.

Results:
Forty-five participants were enrolled at 2 clinical sites and 44 completed 6-month follow-up. Most participants (73.3%) had CRSwNP and bilateral disease (84.4%), and 31.1% had prior surgery. Freedom from MADE at 30 days was 100% (45/45, 95% CI 69.2%, 100.0%). Freedom from reintervention at 6 months was 95.6% (43/45, 95%CI 83.4%, 98.9%). Mean SNOT-22 change from baseline was –23.5±15.0 (P<.0001). Mean Lund-Mackay score improved by –5.4±5.8 (P<.0001). In a fifteen-participant pharmacokinetic cohort, plasma paclitaxel Cmax was 0.195 ng/mL at Tmax 2 days, undetectable after 3 days.

Conclusion:
This is the first use of paclitaxel-coated sinus balloons in CRSwNP or CRSsNP and the first reported use of balloon dilation in surgically resected ethmoid cavities. Use of the Airiver Sinus DCB with ESS is safe and results in improvements in CRS symptoms, with low reintervention rates.

4:05 pm – 4:10 pm
Q&A

4:11 pm – 4:55 pm
Panel: Spontaneous CSF Leaks: Contemporary Algorithms
Moderator: Corinna Levine, MD, FARS
Panelists: Jessica Grayson, MD; Kibwei McKinney, MD; Erin Reilly, MD; Sanjeet Rangarajan, MD, FARS

4:55 pm – 5:00 pm
Q&A

5:00 pm – 5:30 pm
ARS Business Meeting

5:30 pm – 7:00 pm
ARS President's Reception
Sheraton, Phoenix DE

Saturday, April 25, 2026
Afternoon Session – Room 2
Convention Center, 102 ABC
1:00 pm – 5:00 pm MST

Room Moderator: Jivianne Lee, MD, FARS

Session Moderators: Michael Kohanski, MD, FARS; Lauren Roland, MD

1:00 pm – 1:06 pm
Olfactory training, quality-of-life and neuropsych outcomes: A systematic review and meta-analysis
Joon Soo Kim, BS
Stefany Lazieh, Medical Student
Wassim Najjar, Postdoctoral Research Fellow
Emily Joseph, Librarian
Nicholas R. Rowan, MD
Johns Hopkins School of Medicine

Background:
Olfactory dysfunction (OD) is associated with diminished quality-of-life (QOL), depressive symptoms, and cognitive decline. Olfactory training (OT) is a low-risk intervention designed to support olfactory recovery, and emerging evidence suggests that OT may mitigate the broader impacts of OD. This review aims to systematically evaluate the effects of OT on QOL, depression, and cognitive outcomes.

Methods:
PubMed, Embase, Cochrane, Scopus, and Web of Science were searched for studies published between 1990-2025. Two reviewers independently screened studies and extracted data following PRISMA guidelines, and disagreements were resolved using a consensus method. A meta-analysis was performed on QOL outcomes (using the Questionnaire of Olfactory Disorders (QOD)), and a

narrative synthesis summarized the findings on depressive symptoms and cognitive function, secondary to heterogeneity in outcome measures.

Results: Fifty-three studies assessed the effects of OT on QOL, depression, and cognition, with 11 studies (N=300) reporting QOD. Subjects reported significant QOD improvements (SMD=0.45; 95% CI: 0.17-0.72) after OT. Among controlled trials (N=210), OT produced a significant advantage in QOD improvement over no OT (SMD=0.40; 95% CI: 0.01-0.79). Thirteen studies reported significant cognitive improvements following OT, and three studies reported significantly reduced depressive symptoms following OT.

Conclusion:
This review indicates that the benefits of OT may extend beyond olfactory recovery, including improved QOL, cognition, and in some reports, depressive symptoms. These findings highlight the potential of OT as a low-cost intervention to support the multi-faceted challenges experienced by individuals with OD.

1:07 pm – 1:13 pm
Psychometric evaluation of novel olfactory measure, u-smell-it, in chronic rhinosinusitis
Claire Perrin, BS
Jennifer S. Lee, Medical Student
Benjamin Bernard, PGY-5
Vivienne Li
Omer Baker, Medical Student
Clifford He, Medical Student
Thomas Zhou, BS
Adam DeConde, MD
Carol H. Yan, MD
University of California San Diego School of Medicine

Objective:
Quantitative, reliable olfactory assessment is needed to monitor disease burden and treatment response in chronic rhinosinusitis (CRS), but existing psychophysical tests are costly and impractical for frequent use. The novel u-Smell-it has been shown to accurately screen for olfactory dysfunction (OD) and correlate strongly with established psychophysical measures. This study evaluated the test's suitability for longitudinal use by assessing test-retest reliability and responsiveness to clinical change.

Methods:
Test-retest reliability was assessed in healthy controls (N=37) with repeat testing at least 2 weeks apart. A separate cohort of CRS patients undergoing sinus surgery (N=51) was used to evaluate clinical responsiveness and validity. u-Smell-It scores, VAS smell ratings, and SNOT-22 scores were collected at baseline and postoperative follow-up. Pearson correlation assessed reliability, and Wilcoxon and Spearman tests evaluated postoperative change and associations with subjective smell.

Results:
Test-retest reliability demonstrated a moderate association (r=0.47, p=0.003). In CRS patients, u-Smell-it scores increased from 3.48±1.62 at baseline to 4.25±1.16 at mo 3 (p=0.037). Longitudinal correlations with the SNOT-22 smell item were moderate and significant (baseline rho=-0.50, wk 3 rho=-0.45, wk 5 rho=-0.47). Correlation with total SNOT-22 scores was weak (rho=-0.16, p=0.062).

Conclusion:
u-Smell-It demonstrates measurable postoperative improvement in CRS and meaningful correlations with subjective smell ratings. Although single-test reliability is modest, like other short olfactory tools, the test provides an inexpensive and scalable method for repeated olfactory tracking in clinical and research settings.

1:14 pm – 1:20 pm
Gabapentin response in parosmia: A two-year retrospective review
Do-Yeon Cho, MD;
Jessica Grayson, MD
Bradford Woodworth, MD, FARS
Justin Turner, MD, FARS
Nicolaus Knight, MS
University of Alabama at Birmingham

Introduction:
Parosmia is a qualitative olfactory disorder characterized by distorted odor perception and substantial quality-of-life impairment. Neuromodulators such as gabapentin are used clinically, yet real-world evidence remains limited. This study evaluated patient characteristics and outcomes following gabapentin therapy in a tertiary academic smell and taste clinic.

Methods:
We performed a retrospective chart review of patients with parosmia who initiated gabapentin (maximum 600 mg daily for > 4 weeks) between February 2023 and January 2025. Demographics, etiology of smell loss, baseline Threshold-Discrimination-Identification (TDI) scores, and documented clinical response were collected. Outcomes were compared between post-viral and non–post-viral etiologies.

Results:
43 patients (mean age 53.7+/-13.9 years; 67% female) required intervention due to severity of symptoms. Patients with parosmia exhibited higher baseline TDI scores (24.6+/-7.6) than the overall smell-loss cohort (n=361; 20.7+/-8.7), indicating relatively preserved quantitative olfaction despite severe qualitative dysfunction (p<0.01). Post-viral

etiologies were most common (n=29), which also exhibited higher baseline TDI scores (26.6+/-6.2) than non-viral cases (20.5+/-8.7) (P<0.05). Gabapentin response was significantly more favorable among post-viral patients, with higher rates of partial or complete improvement compared with non-viral cases (p<0.05).

Conclusions:
Gabapentin offers meaningful symptomatic benefit for parosmia, particularly in post-viral etiologies. These findings provide real-world support for neuromodulation in the targeted management of parosmia and highlight the need for prospective controlled trials to refine therapeutic strategies.

1:21 pm – 1:27 pm
Efficacy of platelet-rich plasma therapy for persistent olfactory dysfunction: A meta-analysis
Tommy Jacob, MD, MPH
Hen Chaushu
Sofi Matot
Forsan Jahshan, MD
Abraham Abergel
Narin N. Carmel-Neiderman, Dr

Aim:
This meta-analysis evaluates PRP's efficacy in improving olfactory function for patients with OD lasting more than six months.

Methods:
We conducted a meta-analysis of all publications available between January 1961 through September 2024 that reported the efficacy of PRP injections for OD of any etiology lasting over six months. Objective (Threshold-Discrimination-Identification, TDI) and parient reported outcome (Visual Analogue Scale, VAS; Questionnaire of Olfactory Disorders, QOD) measures were compared between a PRP treatment group and a control group. A subgroup analysis was also conducted based on follow-up duration.

Results:
Six studies (n=347 patients), met inclusion criteria. Results showed a significantly greater improvement in TDI scores in the PRP treatment group compared to controls (random effect = 1.357 [95% CI: 0.014–2.7], I^2 = 93%). Subgroup analysis revealed a statistically significant increase in TDI scores at one-month follow-up (random effect = 1.356 [95% CI: 0.311–2.402], I^2=90%), but not at the three-month follow-up. Differences in VAS scores between the treatment and control groups were not found statistically significant.

Conclusion:
This meta-analysis suggests that PRP injection for persistent olfactory dysfunction may be an effective short-term treatment, with benefits observed for up to three months. However, questions remain regarding specific populations that may benefit most from this therapy. Further studies with extended follow-up are needed to clarify its long-term effectiveness.

1:28 pm – 1:34 pm
Response to olfactory dysfunction: A cluster analysis from a tertiary smell and taste clinic
Tom Fischer, MD
Keren Avirame
Idan Peled, Dr
Ella Hazan
Elinoy Herstain, Research Student
Hen Chaushu
Nidal Muhanna, MD, PhD
Abraham Abergel
Narin N. Carmel-Neiderman, Dr

Objective:
Olfactory dysfunction (OD) is commonly associated with reduced quality of life (QOL) and affective disturbances, yet patients differ markedly in their emotional and behavioral adaptation to smell loss. This study aimed to identify distinct psychological response patterns among individuals with OD.

Methods:
participants were recruited from the Smell and Taste Clinic at Tel Aviv Sourasky Medical Center, after completing the Sniffin' Sticks test, alongside standardized questionnaires assessing sinonasal QOL (He-SNOT-22, He-NOSE); olfactory related QOL (He-QOD) and general well-being (WHO-5) and affect (PANAS). K-means clustering was applied to identify distinct psychological response profiles.

Results:
A total of 128 participants (80 OD patients; 48 healthy controls) were recruited. Patients showed significantly lower TDI scores ($p < .001$) and higher symptom burden and olfactory-related QOL impairment than controls ($p < .001$). Cluster analysis revealed three psychological response profiles: High-distress, Intermediate-distress, and Low-distress - which strongly aligned with diagnostic status ($\chi^2(2)=73.4$, $p<.001$). Patients with high-distress response reported greater taste impairment despite better olfactory thresholds and discrimination than patients with intermediate-distress ($\chi^2(1)=5.59$, $p=.018$).

Conclusions:
OD Patients exhibit distinct psychological response profiles that differ in affect, well-being, and QOL impact, despite comparable sensory impairment. The dissociation between objective olfactory performance and subjective measures of affect and well-being highlights the need for multidimensional assessment to support personalized evaluation, targeted interventions, and psychoeducation.

1:35 pm – 1:40 pm
Q&A

1:41 pm – 2:11 pm
Short Panel: Executive Coaching & Leadership Development for Rhinologists
Moderator: Stephanie Joe, MD, FARS
Panelists: Dara Adams, MD; Karen Bednarski, MD, FARS; Richard Orlandi, MD, FARS; John Schneider, MD
Sponsored by the Mentorship Committee

Session Moderators: Garret Choby, MD, FARS; Jose Mattos, MD

2:12 pm – 2:18 pm
Traffic exposure and greenspace in CRS
Stefany Lazieh, BA
Cole Brokamp, Associate Professor of Pediatrics
Zhenyu Zhang, Assistant Professor
Nyall London, MD, FARS
Nicholas R. Rowan, MD
Andrew Lane, MD, FARS
Jayant Pinto, MD, FARS
Shyam Biswal
Murugappan Ramanathan, MD, FARS
Johns Hopkins School of Medicine

Background:
Traffic-related air pollution and reduced greenspace have been linked to lower airway disease, but their relationship with chronic rhinosinusitis (CRS) remains incompletely understood.

Methods:
We performed a case-control study of 6,523 CRS patients matched 1:1 to controls seen from 2013–2023 at a tertiary medical center. Residential addresses were geocoded using DeGAUSS. Exposures included living ≤400 m from primary interstate (S1100) or state highways (S1200), and surrounding greenspace was quantified by enhanced vegetation index (EVI) within 500, 1500, and 2500 m buffers. Conditional logistic regression estimated odds ratios (ORs) adjusting for deprivation index, demographics, and comorbidities.

Results:
CRS patients were more likely to live within 400 m of an S1100 interstate (9.3% vs. 7.8%). Living near an interstate was associated with higher CRS odds (fully adjusted OR 1.22, 95% CI 1.06–1.39), whereas proximity to S1200 highways showed no association. Greater greenspace was protective: higher EVI within 1500 m and 2500 m was associated with lower CRS odds (OR 0.93, 95% CI 0.90–0.97; OR 0.91, 95% CI 0.87–0.96). Associations remained robust after adjustment for socioeconomic factors and clinical covariates, while the 500 m buffer was not significant after full adjustment.

Conclusion:
To our knowledge, this is the largest study to demonstrate residential proximity to major interstate highways is independently associated with increased CRS risk, whereas greater surrounding greenspace appears protective. These findings highlight the role of environmental exposures in CRS pathogenesis and support incorporating environmental risk assessment into clinical care and urban planning.

2:19 pm – 2:25 pm
Temporal and geospatial market analysis of endoscopic sinus surgery
Akshay Warrier, BA
Syndey Langer, Medical Student
Francesca Zarbin, Medical Student
David Wassef, Resident Doctor
Jean Anderson Eloy, MD, FARS

Introduction:
Medicare reimbursement for endoscopic sinus surgery (ESS) faces mounting cost pressures and shifting market dynamics. The extent to which payments reflect procedural demand, provider consolidation, and regional economic variation remains poorly defined.

Methods:
National and Provider-level Medicare data were queried for ESS procedures from 2013–2023. Inflation-adjusted weighted mean payments (2023 USD), market concentration via Herfindahl–Hirschman Index (HHI), and geographic variation via coefficient of variation (CV) were evaluated. Urban–suburban–rural differences and correlations between reimbursement and county-level cost of living were assessed using Spearman coefficients and temporal stratification.

Results:
Inflation-adjusted ESS reimbursement remained essentially flat (~$630). Market concentration increased (HHI: 0.16→0.22), indicating rising consolidation among ESS providers. Provider volume rose modestly post-2019 (27→32 cases/provider). Geographic disparities widened considerably (CV: 0.39→0.65, $p<0.001$), while urban–rural payment differences were not significant ($p=0.52$). Reimbursement showed persistent misalignment with cost pressures, with correlation shifting from negative pre-2019 ($\rho\approx-0.30$) to only weakly positive in 2023 ($\rho=0.18$).

Conclusions:
National ESS reimbursement has not kept pace with economic realities, while consolidation and widening geographic variation signal increasing fragility in the payment landscape. These findings reveal fundamental limitations in Medicare's ability to provide equitable support for sinus care delivery,

underscoring the need for policy mechanisms that are responsive to regional cost structures and evolving market forces.

2:26 pm – 2:32 pm
Medicare advantage denials for rhinologic procedures subject to independent review, 2023-2024
Ericka Erickson, MD, MBA
Eric Ramos, Medical Student
Sriram Satyavolu, Medical Student
Jack Birkenbeuel, Resident Physician
Toby Steele, MD
Kathleen Kelly, MD
Vinay Rathi, MD
Ohio State University Wexner Medical Center

Introduction:
There are concerns that Medicare Advantage (MA) plans are denying appropriate care to maximize profits. However, much is unknown about the real-world implementation of appeal efforts by patients and clinicians. We sought to understand the nature of MA denials for rhinologic procedures and outcomes of appeals.

Methods:
We queried the CMS Appeals Decision Search Database to perform a cross-sectional analysis of all denials by MA plans for rhinologic procedures that were subject to independent review between 2023-2024. We excluded appeals for non-procedural care and anterior skull base pathology. We classified denials by year, clinical condition(s) and procedure(s) (non-mutually exclusive), CMS-defined rationale, and CMS-defined appeal outcomes. We characterized denials using descriptive statistics.

Results:
Our analysis included 468 denials subject to independent review; the number of denials increased from 129 (29.7%) in 2023 to 329 (70.3%) in 2024. Procedures were largely indicated for chronic sinusitis (n=221; 47.2%), nasal valve collapse (n=89; 19.0%), and rhinitis (n=85; 18.2%). Most denials (n=369; 88.4%) were for device-related procedures, including balloon sinuplasty (n=167; 35.7%), Latera or VivAer (n=139; 31.0%), or Clarifix or RhinAer (n=90; 20.1%). The most common denial reasons were service non-coverage (n=249; 55.6%) and inadequate documentation (n=167; 37.3%). Few (n=20; 4.3%) denials were partially or fully overturned.

Conclusion:
Most denials were for device-based procedures not covered by plan policies or supported by required documentation. Appeal success rates were low. Targeted clinician education on documentation and payment advocacy may reduce denial burden on patients and providers.

2:33 pm – 2:39 pm
Comparative analysis of frailty indices in endoscopic sinus surgery
Akshay Warrier, BA
Francesca Zarbin, Medical Student
Syndey Langer, Medical Student
David Wassef, Resident Doctor
Jean Anderson Eloy, MD, FARS

Introduction:
Frailty is increasingly recognized as a critical determinant of surgical outcomes, yet its role in endoscopic sinus surgery (ESS) is poorly understood. Accurate preoperative risk stratification tools remain limited in otolaryngology.

Methods:
Adult ESS cases were extracted from ACS-NSQIP (2005–2020). Frailty was quantified using the Risk Analysis Index (RAI) and Modified Frailty Index-5 (mFI-5). Multivariable logistic regression assessed associations between frailty and postoperative morbidity, including Clavien–Dindo (CD) complications, wound dehiscence, surgical-site infection (SSI), extended length of stay (eLOS), and non-home discharge (NHD). Discrimination was evaluated using receiver-operating-characteristic analysis.

Results:
Among 1,871 patients, higher RAI scores were strongly associated with CD II (OR 5.78), CD IV (OR 4.34), eLOS (OR 11.7), and NHD (OR 5.99; OR 10.2 in severe frailty). mFI-5 independently predicted eLOS (OR 3.18) and NHD (OR 4.85). Severe frailty carried markedly elevated odds of CD IV (OR 12.3), eLOS (OR 10.8), and NHD (OR 20.0). RAI demonstrated stronger discrimination for NHD (AUC 0.730 vs 0.721), CD II (0.619 vs 0.547), and wound dehiscence (0.782 vs 0.308). mFI-5 showed modestly higher performance for mortality (0.684 vs 0.587), eLOS (0.636 vs 0.598), and CD IV (0.656 vs 0.620). Overall, RAI outperformed mFI-5 in six of eleven outcomes.

Conclusions:
Frailty meaningfully stratifies postoperative risk in ESS. RAI provides superior discrimination for major complications and discharge disposition, while mFI-5 retains advantages for mortality-related risk. These findings position RAI as a practical, high-yield screening tool to enhance perioperative decision-making in ESS.

2:40 pm – 2:46 pm
Psychometric validity of the overall symptom severity score for chronic rhinosinusitis
Christine Lee, BA, MPH
Imani Agard, Medical Student
Nikhil Parail, Medical Student
Khaleel Wilson, Resident Physician
Katie Phillips, MD, FARS
Ahmad R. Sedaghat, MD
University of Cincinnati College of Medicine

Background:
Overall symptom severity (OSS) is a global metric of chronic rhinosinusitis (CRS) symptom severity. We sought to establish psychometric validity for the OSS which has not been previously demonstrated in the literature.

Methods:
Adult patients with CRS (N=647) recruited and completed an OSS score, and SNOT-22 and EQ-5D questionnaires. A subset of participants completed these questionnaires at a second time point to establish test-retest reliability (N=65) and responsiveness to change (N=225). Psychometric validation was performed by establishing criterion validity, test-retest reliability and responsiveness in these CRS patients.

Results:
The OSS score was significantly correlated with SNOT-22 (r=0.73, 95%CI: 0.69 – 0.76, p<0.001) and EQ-5D VAS scores (r= -0.39, 95%CI: -0.46 – -0.33, p<0.001) at enrollment, demonstrating criterion validity. For the subset of participants who completed the OSS at a second time point ranging between 31 – 143 days later, the change in OSS was correlated with changes in SNOT-22 score (r=0.72, 95%CI: 0.65 – 0.78, p<0.001), and EQ-5D VAS (r= -0.30, 95%CI: -0.42 – -0.18, p<0.001). The OSS score also demonstrated excellent test-retest reliability (r=0.92, 95%CI: 0.87 – 0.95, p<0.001). Using a distribution-based and four different anchor-based calculations, the minimal clinically important different (MCID) for improvement and worsening for OSS score was determined as ≥1.6 (or >1.5).

Conclusions:
The OSS score is a psychometrically valid measure of CRS symptom severity, with excellent criterion validity, test-retest reliability and responsiveness. The MCIDs for improvement and worsening are proposed to be ≥1.6 (or >1.5).

2:47 pm – 2:55 pm
Q&A

2:56 pm – 3:29 pm
Break with Exhibitors

Session Moderators: Omar Ahmed, MD, FARS; Kara Detwiller, MD, FARS

3:30 pm – 3:36 pm
Temperature-controlled versus impedance-controlled posterior nasal nerve radiofrequency ablation
Prem Patel, BS
Nathan Sheets, Medical Student
Tim Mose, Medical Student
Matt Hayward, Health Science Librarian
Philip Chen, MD, FARS

Background:
Chronic rhinitis (CR) poses a significant burden, especially among refractory patients. Posterior nasal nerve radiofrequency ablation (RFA) is a novel therapy shown to improve symptoms, although comparisons between specific modalities are limited. This analysis compares two RFA treatments: temperature-controlled (TC) and impedance-controlled (IC).

Methods:
A systematic search for TC and IC studies was conducted in November 2025. Meta-regression calculated pooled change in the reflective total nasal symptom score (rTNSS) and its individual subscores over time. Fisher's exact test compared adverse event (AE) incidences.

Results:
The search resulted in 5 unique studies and 8 follow-up reports, comprising a total of 399 patients (TC = 283, IC = 116). Change in rTNSS for both treatments surpassed the standard minimal clinically meaningful difference (-1) at 30 days (TC = -4.1, 95% CI: -4.7 to -3.4; IC = -3.8, 95% CI: -4.6 to -3.1), which was sustained through all overlapping time points. Overall rTNSS change was not significantly different between treatments; however, TC exhibited superiority for the congestion subscore starting at 90 days and for the rhinorrhea subscore starting at 180 days (all p < 0.05). A low number of patients reported AEs (TC = 7.4%, IC = 7.8%, p = 1.000), and few AEs were described as severe (TC = 23.8% IC = 11.1%, p = 0.637).

Conclusions:
TC and IC RFA both display prompt and sustained symptom reduction in CR. TC may be particularly beneficial for patients whose main complaints are congestion or rhinorrhea. AE burden is low and similar between devices. Findings are limited by study quantity, and additional reports are needed to clarify potential treatment differences as new clinical

3:37 pm – 3:43 pm
Neuroimmune effects of TCRF PNN ablation for chronic rhinitis
Elina M. Toskala-Kennedy, MD, PhD, FARS
Bryan Davis, MD
Larry Harshyne, PhD
Shannon Lynch, PhD, MPH
Katie Phillips, MD, FARS
Thomas Jefferson University

Rationale:
Chronic rhinitis (CR) features persistent mucosal inflammation and heightened neuronal responsiveness. Temperature-controlled radiofrequency (TCRF) ablation of PNNs provides symptom improvement in both allergic (AR) and non-allergic (NAR) CR patients, but its effects on neuroinflammatory pathways are not known.

Methods:
In this multicenter study, 25 adults (15 AR, 10 NAR) with moderate to severe CR underwent PNN TCRF. Nasal secretions were collected at baseline and 3 months using a standardized sponge method and analyzed by multiplex ELISA for cytokines and TRPV1, reported as fold-change in mean fluorescent intensity (MFI). CR symptom scores were recorded at baseline, 3, and 6 months.

Results:
Baseline TRPV1 was higher in AR vs NAR (0.97 vs 0.54 MFI; p=.0030). TRPV1 significantly decreased after treatment in both AR (0.77-fold, p=.037) and NAR (0.74-fold, p=.049). Epithelial-associated cytokines (IL-15, IL-25, and TNFa) were significantly reduced overall ($p<0.05$), largely driven by NAR. IL-1a was increased in the AR group ($p<0.05$). Other inflammatory cytokines were stable and some trended downward, suggesting potential attenuation of mucosal inflammatory activity. Mean rTNSS improved from 7.8 (95% CI 7.0–8.7) to 3.1 (95% CI 2.2–4.0) at 6 months (60% improvement); 81.8% were responders.

Conclusions:
These findings support TRPV1-mediated neurogenic inflammation as an important shared pathway in AR and NAR. TCRF PNN ablation significantly reduced neuroinflammatory biomarkers in both groups, consistent with decreased neural hyperreactivity and downregulated neuro-immune signaling, aligning with clinical improvement. Results support neuromodulation as a common mechanism of benefit after TCRF PNN ablation.

3:44 pm – 3:50 pm
Real-world TCRF outcomes in NAO patients
Jordan Pritikin, MD, FARS
Stacey Silvers, MD, FARS
Chicago Nasal & Sinus Center

Objective:
To evaluate real world outcomes among patients with nasal valve dysfunction (NVD) and severe nasal obstruction treated with temperature controlled radiofrequency (TCRF), using electronic medical record (EMR) data and prospectively collected surveys to assess post procedure Nasal Obstruction Symptom Evaluation (NOSE) scores.

Methods:
This ambispective, real world study included patients from eight U.S. otolaryngology practices who underwent TCRF for nasal airway obstruction with documented NVD between January 2020 and December 2023. Analyses were restricted to patients with baseline NOSE scores ≥55 recorded through EMR. Structured surveys captured post procedure NOSE scores. Descriptive statistics, 95% confidence intervals (CIs), and p-values were calculated.

Results:
Among 238 patients with severe/extreme NAO and NVD, 81 had matched EMR and survey NOSE scores. Mean baseline was 75.4 (95% CI, 72.5–78.3) and post procedure mean 28.6 (95% CI, 23.8–33.5), a 46.8 point reduction (62% improvement; $p<0.001$). Seventy-three (90%) patients achieved improvement greater than 20 points, exceeding the minimal clinically important difference threshold and confirming robust, consistent benefit across the cohort.

Conclusions:
In this multicenter, real world analysis, patients with NVD and severe nasal obstruction treated with TCRF achieved large, clinically meaningful, and significant reductions in NOSE scores. This minimally invasive, office based therapy provides durable functional improvement with low procedural burden, supporting TCRF as an effective and accessible treatment for severe NAO due to NVD.

3:51 pm – 3:57 pm
Impact of TCRF posterior nasal nerve ablation on midfacial migraine and disability outcomes
Mark Mehle, MD
Stacey Silvers, MD, FARS
Karen Hoffmann, MD
Scott Roberston, MD
Seth Brown, MD, FARS
Erik Steiniger, MD
Mohamad Chaaban, MD, FARS
David Yen, MD
Marc Dean, MD
Southwest General Hospital

Introduction:
Migraine patients with rhinitis often present with midfacial pain as a component of their migraine disorder. Ablation of posterior V2 trigeminal branches (PNNs) via temperature controlled radiofrequency (TCRF) disrupts sensory and parasympathetic nerves effectively reducing chronic rhinitis symptoms. Whether TCRF PNN ablation can also reduce trigeminally mediated midfacial migraine pain is unknown.

Methods:
Adults with chronic rhinitis and ≥ 10 monthly midfacial migraine headaches (meeting International Classification of Headache Disorders criteria), a positive response (midfacial pain reduction) to local sphenopalatine ganglion block, and CT with Lund-McKay score ≤6 underwent TCRF PNN ablation. Change from baseline in mean monthly migraine headache days (MMHD) and migraine-related disability (MIDAS) were evaluated at 3 and 6 months postprocedure. Responder rate was defined as a ≥50% reduction in MMHD. Adverse events (AEs) were assessed.

Results:
A total of 41 patients were treated with baseline MMHD of 11.2 (SD 6.4). MMHD were reduced 61.4% at 3 months (95% CI -62.9 to -52.8; n=41) and 64.9% at 6 months (95% CI -66.2 to -63.5; n=40). Responder rate was 73.2% at 3 months and 80.5% at 6 months. Mean MIDAS scores were reduced -50.6 points at 3 months (95% CI: −60.0 to −41.06; n=41) and -46.6 points at 6 months (95% CI: −61.9 to −31.3; n=38) from a baseline score of 66.4 (SD 51.4; n=41). Adverse events were limited; one patient had prolonged nasal numbness.

Conclusion:
Our findings suggest that disrupting V2 trigeminal nerves via TCRF PNN ablation in patients with chronic midfacial migraine and chronic rhinitis appears to substantially reduce both migraine headache burden and migraine-related disability.

3:58 pm – 4:04 pm
Healthcare resource utilization after TCRF treatment of NAO
David Kennedy, MD, FACS, FRCSI, FARS
Gavin Setzen, MD, FARS
Ashleigh Halderman, MD, FARS
Kevin Welch, MD, FARS
Bobby Tajudeen, MD, FARS
Gary Owens, MD
Paul Niklewski
Masayoshi Takashima, MD, FARS
Sidney Kimmel Medical College, Jefferson Health

Background:
The impact of nasal obstruction on quality of life (QOL) is frequently underestimated. Nasal valve collapse (NVC) is one structural cause of NAO. Temperature-controlled radiofrequency nasal valve remodeling (TCRF) offers an alternative to invasive surgery. Efficacy is established but impacts of TCRF on healthcare resource utilization (HRU) and cost in real-world settings is underexplored.

Methods:
Two cohorts with NAO were defined from a large general NAO population: a TCRF cohort with an isolated TCRF (index) procedure and a propensity-matched medically managed (MM) cohort with no nasal procedures. HRU and costs were evaluated for a 24-month pre/post index period for both.

Results:
A total of 10,206 TCRF and 50,766 MM patients were analyzed. Significant post-index reductions were observed for TCRF across All Cause Evaluation & Management visits, ENT-related procedures, and sleep-related claim categories. A large reduction in mean daily post-index costs was seen for the TCRF cohort: $68.07 pre-index to $38.75 post-index, (-43.1%). Mean daily costs went up in the MM cohort: $42.08 pre-index to $63.26 post-index, (+50.4%), a total cost savings of $21,418.26 in the TCRF cohort and total cost increase of $15,471.99 in the MM cohort in the 24 month post-index period. TCRF cost reductions were driven by reductions in NAO-related HRU.

Conclusions:
This large, real-world analysis demonstrates substantial reductions in healthcare resource utilization and total costs of care following TCRF treatment sustained over 2 years compared to medically managed patients. The study implicates the impact of nasal obstruction on overall QOL and importance of recognizing nasal valve obstruction in the management of this problem.

4:05 pm – 4:10 pm
Q&A

4:11 pm – 4:55 pm
Panel: The Future of Rhinologic Training & Workforce Implications
Moderator: Stacey Gray, MD, FARS
Panelists: Noel Ayoub, MD; Seth Brown, MD, FARS; Dana Crosby, MD, FARS; Janalee Stokken, MD, FARS

4:55 pm – 5:00 pm
Q&A

5:00 pm – 5:30 pm
ARS Business Meeting

5:30 pm – 7:00 pm
ARS President's Reception
Sheraton, Phoenix DE

Sunday, April 26, 2026
General Session
Convention Center, 105 ABC
8:00 am – 12:00 pm MST

7:00 am – 8:00 am
Young Rhinologists Section Breakfast
Room: Convention Center, 105ABC

Room Moderator: R. Peter Manes, MD, FARS

Session Moderators: Michael Marino, MD, FARS; Christopher Roxbury, MD, FARS

8:00 am – 8:06 am
Multi-omic profiling of noninvasive and invasive fungal sinusitis
Khai Nguyen, PhD
Kevin Chen
Nyssa Farrell, MD
John Schneider, MD
Lauren Roland, MD
Washington University School of Medicine

Introduction:
Invasive fungal sinusitis (IFS) is an aggressive infection with high mortality rates. In contrast, noninvasive fungal sinusitis has excellent prognosis. In this study, we sought to characterize the antifungal tissue response using a multiomics approach.

Materials and methods:
Sinonasal tissues from our surgical biobank (4 healthy controls, 8 immunosuppressed controls, 6 fungal ball patients [FB], 12 IFS) were analyzed using bulk RNA-sequencing. Single-cell RNA and V(D)J sequencing (scRNA/V(D)J-seq) was performed on healthy control, FB, and IFS tissues using the 10X Genomics 5' v2 protocol. Bulk RNA-seq data was analyzed using DESeq2 (v1.34.0) and WGCNA (v1.70-3). scRNA-seq data was analyzed using Seurat (v4.4.0). scV(D)J-seq data were analyzed using scRepertoire (v2.0.0).

Results:
Principal component analysis and deconvolution of bulk data highlighted heterogeneity among IFS samples, likely due to differing mechanisms of immunosuppression. FB is distinguished from IFS by a gene module comprised of multiple B-cell receptor genes. Both FB and IFS showed expansion of macrophages compared to control tissue. FB tissue showed increased proportions of T cells, B cells, and plasma cells; in contrast, these cells were decreased or near-absent in IFS tissue. IFS mucosa was significantly enriched for neutrophils. Receptor-ligand signaling analysis identified distinct signaling circuits between FB and IFS.

Conclusion:
Mucosal bulk- and single-cell profiling of FB and IFS tissue suggests that FB is characterized by a mixed innate-adaptive immune response, whereas IFS harbors a neutrophil-dominant response with deficient adaptive immunity. Future work will explore actionable targets to enhance adaptive responses in IFS.

8:07 am – 8:13 am
WITHDRAWN

8:14 am – 8:20 am
Eosinophil-dependent PAPP-A patterns in chronic rhinosinusitis with nasal polyps
Afaf Ennahal
Olaf Wendler, Dr
Vanessa-Vivien Pesold
Sarina Katrin Müller, Prof. Dr. med.

Background:
High-level expression of PAPP-A/IGFBPs/IGF-1 cascade in chronic rhinosinusitis with nasal polyps (CRSwNP) was previously demonstrated by our group. PAPP-A plays a key role in inflammatory diseases and cancer. The aim of this study was to localize PAPP-A in chronic rhinosinusitis (CRS), within tissue, inflammatory and different primary cells.

Methodology:
PAPP-A was localized by immunohistochemistry (IHC) in tissues of CRSwNP (n=41), CRSsNP patients (n=12) as well as in controls (n=12). The data of eosinophil abundance in CRSwNP tissues was obtained from routine pathology. ELISA was used to quantify PAPP-A and ECP non-invasively in CRSwNP mucus (n=67). On a cellular level, PAPP-A was localized by immunofluorescence (IF) in immune and primary cells from CRSwNP (n=18).

Results:
IHC revealed three distribution patterns of PAPP-A in CRSwNP correlated to the eosinophil abundance. Moreover, IF of different immune cells confirmed the

high PAPP-A synthesis by eosinophils, in addition to unspecified subpopulation of T-cells and moderately in mast cells. Besides, a vesicular distribution of PAPP-A in the cytoplasm and the membrane of epithelial and fibroblast cells was shown. Finally, ECP and PAPP-A proved a significant correlation in CRSwNP mucus.

Conclusions:
Our work is the first to illustrate the three distribution patterns of PAPP-A in CRSwNP. This underlines the potential inflammatory role of PAPP-A particularly in CRSwNP. Targeting the PAPP-A/IGFBPs/IGF-1-axis may be a new therapeutic approach for CRSwNP with high eosinophil abundance.

8:21 am – 8:27 am
Transcriptome of type 2 CRS
Naweed Chowdhury, MD, MPH
Brian Cameron, MD
Jeffanie Gayoso
Christina Dorismond, MD
Ping Li
Rakesh Chandra, MD, FARS
Justin Turner, MD, FARS
Vanderbilt University Medical Center

Introduction:
The management of chronic rhinosinusitis (CRS) has been revolutionized by the use of monoclonal antibodies targeting type-2 inflammation; however, there is limited understanding of how human epithelial behavior is pathologically altered under these conditions. In this study, we sought to use transcriptomics to identify differential gene expression patterns in type 2 high vs low CRS.

Methods:
84 patients undergoing ESS for CRS were enrolled in a prospective longitudinal observational study. A multiplex flow cytometric bead assay was used to quantify and define a type-2 high inflammatory state from mucus samples. High-throughput RNA-sequencing was performed on middle meatal brushings to quantify human transcriptome expression counts. Differential expression analysis and gene-set enrichment analysis (GSEA) were used to identify genes and pathways that were upregulated and downregulated in Type 2 CRS.

Results:
Overall, 23 genes had significant differential expression in Type 2 CRS, with 16 upregulated genes including cystatin (logFC = 6.4, p.adj < 0.0001), parathyroid-like hormone (logFC = 5.03, p.adj < 0.001), CLC (logFC = 4.2, p.adj < 0.001), intelectin-1 (logFC = 4.07, p.adj < 0.001), CPA3 (logFC = 3.4, p.adj < 0.001), and periostin (logFC = 3.81, p.adj < 0.001). Seven genes were significantly downregulated, including secretoglobin 3A1 (logFC = -3.12, p.adj = 0.028), keratin-14 (logFC = -2.84, p.adj = 0.023), and CXCL11 (logFC = -2.67, p.adj = 0.028).

Conclusions:
Type-2 high CRS is characterized by upregulation of pathways associated with activation of mast cells and eosinophils as well as extracellular matrix remodeling, with downregulation of genes associated with normal basal cell proliferation.

8:28 am – 8:32 am
Q&A

Session Moderators: Naweed Chowdhury, MD, MPH; Chadi Makary, MD, FARS

8:33 am – 8:39 am
Therapeutic potential of RADA16 to reduce allergen and exogenous-CRS related inflammation
Jennifer Mulligan, PhD
University of Florida

Background:
RADA16 is a self-assembling peptide that forms a nanofibrous hydrogel upon exposure to physiologic pH. RADA16 has been used to control bleeds and promote wound healing following endoscopic sinus surgery. In these studies, we explored a novel role of RADA16 to reduces exogenous and allergen induced inflammation from human sinonasal epithelial cells (HSNEC).

Methods:
Human sinonasal epithelial cells from patients having skull base surgery (control) or for nasal polyps were cultured in the air liquid interface for 21 days. RADA16 was applied to the apical surface. For experiments examining the ability to reduce allergic inflammation, cells were treated with Aspergillus Fumigatus (Af) extract (Greer Laboratories). Antigen passage to the basolateral side was measured by Dextran-FITC passage. Inflammatory mediator secretion was measured by ELISA.

Results:
At 6 hours, RADA16 significantly reduced exogenous basolateral IL-8, IL-6, C3, and C3a, and at 24 hours, significantly reduced both basolateral and apical IL-6, C3, and C3a. At two weeks, apical C3 and C3a levels remained reduced, while IL-6 and IL-8 had returned to near control levels. Inflammation from CRSwNP HSNEC, was reduced to levels similar to that seen in control HSNEC. With regards to allergic inflammation, RADA16 blocked Af induced allergen passage into the basolateral space and blocked the ability of Af to induce secretion of C3, IL-6 and IL-8 in response to allergen challenge.

Conclusions:
RADA16 has the ability to reduce both exogenous-CRSwNP and allergen-induced inflammation in HSNEC. These findings highlight a potential novel role for RADA16 as an anti-inflammatory agent associated with CRSwNP and allergic inflammation.

8:40 am – 8:46 am

TP53 codon 72 polymorphism and MUC5AC endotypes in CRSsNP

Michael Price, MD, PhD
Michael Kim
Nathalie Baumlin
Sharon Nunoo
John Dennis
Alexander Chiu, MD, FARS
Matthias Salathe
University Of Kansas Medical Center

Background:
Chronic rhinosinusitis (CRS) is marked by epithelial dysfunction and dysregulated mucosal repair. The CRS without nasal polyps (CRSsNP) subtype often have variable clinical outcomes without clear molecular explanations. Genetic variation in TP53 codon 72 is gaining recognition as a modulator of epithelial stress and repair. We hypothesize that TP53 codon 72 variants drive distinct inflammatory signatures in CRSsNP.

Methods:
We collected nasal epithelial cells from 22 CRSsNP patients and 21 controls without sinusitis undergoing sinonasal surgery. We quantified MUC5B, MUC5AC, MMP9, and TGFB1 mRNA expression by qPCR and genotyped for TP53 (rs1042522; RR or PR) variants. We compared relative mRNA expression, Lund-Mackay scores and history of previous surgery between CRSsNP and control groups and within CRSsNP by TP53 genotype.

Results:
Nasal epithelial cells from CRSsNP patients exhibited upregulation of mucin (MUC5B; 0.018 vs. 0.004, $p < 0.05$) and remodeling-associated (MMP9; 0.011 vs. 0.003, $p = 0.030$ and TGFB1; 0.050 vs 0.032, $p < 0.05$) transcripts compared to controls. MUC5AC expression did not differ between CRSsNP and controls (0.25 vs. 0.22, $p = 0.46$). Within CRSsNP, the TP53 RR genotype was associated with elevated MUC5AC expression versus PR (0.41 vs 0.12; $p < 0.05$). There was no association between Lund McKay or revision surgery to genotype or mRNA levels.

Conclusion:
TP53 codon 72 polymorphisms, particularly the RR genotype, are associated with increased MUC5AC expression in CRSsNP. These findings highlight a potential genetic basis for epithelial inflammatory heterogeneity and warrant further investigation into TP53-mediated CRS endotypes.

8:47 am – 8:53 am

Surgery-induced changes in peripheral immune cell subsets differ between CRSwNP and AERD

Kathleen Bartemes, PhD
Hunter Danielle, Research Technologist
Marisa Griesel, Research Technologist
Chien-Chang Chen
Elina Jerschow
Rohit Divekar, Consultant - Allergic Diseases
Erin O'Brien, MD, FARS
Mayo Clinic

Introduction:
Changes in peripheral immune cell prevalence following endoscopic sinus surgery (ESS) differ between subtypes of chronic rhinosinusitis with nasal polyps (CRSwNP). Cytometry by time of flight (CyTOF) identifies more immune cell subsets than standard clinical testing. We hypothesized that ESS is associated with a change in subsets of peripheral immune cells that differs between aspirin tolerant (AT)-CRSwNP and aspirin exacerbated respiratory disease (AERD).

Methods:
Peripheral blood drawn pre- and post-ESS from patients with AT-CRSwNP or with AERD was tested for immune cell populations by CyTOF using a panel of 37 markers. CITRUS analysis identified cell clusters most predictive of patient group or sample timepoint.

Results:
In the combined cohort, CD4+ naïve T cells and CD194+ neutrophils (neuts) increased after ESS, while eosinophils (eos) decreased. Disease subtype stratification showed that the CD4+ naïve T cell increase was maintained in both AERD and AT-CRSwNP post-ESS. Neut subsets showed a mixed response in both patient groups after ESS. Eos decreased in AT-CRSwNP after ESS but not in AERD. AT-CRSwNP showed increased dendritic cells (DCs) after ESS. Analysis at each timepoint showed increased CD141+ monocyte-derived DCs (moDCs) in AT-CRSwNP both pre- and post-ESS. CD185+ neuts were increased in AT-CRSwNP and CD197+ neuts were increased in AERD pre-ESS only.

Conclusion:
Prevalence of CD141+ moDCs was higher in AT-CRSwNP versus AERD both before and after ESS. ESS resulted in increased naïve CD4+ T cells and caused changes in neut subsets in all groups, but eos decreased only in AT-CRSwNP. Our study points to possible systemic effects of ESS and mechanisms of disease pathology in AT-CRSwNP and AERD.

8:54 am – 9:00 am
Ancestry-stratified genetic analysis of CRS in minority populations
Akshay Prabhakar, BSA
Justina Varghese
Wajih Raza
Sebastian Guadarrama-Sistos Vazquez, Dr
Chadi Makary, MD, FARS
Renjie Hu, Dr
Masayoshi Takashima, MD, FARS
Omar G. Ahmed, MD, FARS
Houston Methodist Hospital

Introduction:
Chronic rhinosinusitis (CRS) affects 12% of the US population, yet its genetic basis remains poorly characterized across diverse ancestries.

Methods:
We conducted a genome-wide association study (GWAS) using whole-genome sequencing data from 7,302 participants (3,651 CRS cases, 3,651 propensity-score matched controls) from the All of Us research database. Quality control excluded low-quality samples (genotype call rate <95%, heterozygosity outliers) and variants (call rate <95%, Hardy-Weinberg equilibrium $p<10^{-15}$). Common variants (MAF>1%) were tested using REGENIE, adjusting for age, sex, and 20 principal components to account for population structure. Ancestry-stratified analyses were conducted in European (n=5,068), African (n=904), and Hispanic (n=795) groups.

Results:
European ancestry participants showed associations in DOCK7 (β=2.77, $p=4.6\times10^{-3}$), AIMP1 (β=2.46), and TMPRSS5 (β=2.44), implicating immune signaling and epithelial protease pathways. African ancestry participants demonstrated distinct signals at PLS1 (β=4.34) and CCDC40 (β=4.20), genes involved in cytoskeletal organization and mucociliary clearance. Hispanic participants revealed unique associations with PEX2 (β=15.24), CSNK2A1 (β=14.54), and CRELD1 (β=11.25), implicating oxidative stress regulation, inflammatory signaling, and epithelial barrier function. No variants reached genome-wide significance ($p<5\times10^{-8}$), consistent with moderate sample sizes in stratified analyses, but stratified analyses revealed ancestry-specific patterns of genetic risk.

Conclusion:
This is the first CRS GWAS to reveal distinct genetic signals across ancestry groups, warranting validation in additional population cohorts to explore their possible roles in underlying CRS pathophysiology.

9:01 am – 9:04 am
Q&A

9:05 am – 9:30 am
Panel: Advocacy as a Professional Imperative
Moderator: Devyani Lal, MD, FARS
Panelists: Elisa Illing, MD, FARS; R. Peter Manes, MD, FARS; Troy Woodard, MD, FARS

9:31 am -10:01 am
Break with Exhibitors

Session Moderators: Stephanie Smith, MD; Dennis Tang, MD, FARS

10:02 am – 10:08 am
Machine learning-based predictive modeling for the development of chronic rhinosinusitis
Justina Varghese, BA
Akshay Prabhakar, Mr
Sicong Chang, Mr
Sebastian Guadarrama-Sistos Vazquez, Dr
Renjie Hu, Dr
Michael Yim, MD, FARS
Xin Fu, Dr
Masayoshi Takashima, MD, FARS
Omar G. Ahmed, MD, FARS
Houston Methodist Hospital

Introduction:
Machine learning is increasingly applied to disease risk prediction. For chronic rhinosinusitis (CRS), prior models focused on surgical outcomes and subtypes, with limited work on early risk prediction using longitudinal data.

Methods:
Using the All of Us Research dataset, we identified individuals with ≥2 CRS diagnoses within two years (n = 10,399) and matched controls (n = 31,197) via 1:3 propensity score matching on demographics. Candidate predictors included medical events documented within two years before diagnosis (or index date), ranked by prevalence differences between cohorts. For each individual, events were summarized as binary indicators, total counts, and recency (days before diagnosis). An XGBoost machine learning model assessed feature importance via odds ratios (ORs) and 95% confidence intervals (CIs) for the top 100 predictors after excluding CRS-related examinations.

Results:
The model achieved 87.90% accuracy, AUC = 0.93 (95% CI: 0.92–0.95), sensitivity = 86.09%, and specificity = 89.81%. Strongest predictors before CRS included acute sinusitis (OR = 2.71, 95% CI 2.23–3.30), nasal congestion (2.03, 1.67–2.47), chronic rhinitis (1.92, 1.58–2.33), otitis media (1.91, 1.58–2.33), septal deviation (1.78, 1.46–2.16), eustachian tube dysfunction (1.73, 1.43–2.11), bronchiectasis (1.66, 1.37–2.02), allergic asthma (1.62, 1.33–1.97), and allergic rhinitis (1.54, 1.26–1.87).

Conclusion:
Machine learning demonstrated high discrimination in identifying early CRS predictors. Prominent signals included sinonasal inflammation, airway disease, otologic and allergic disorders, highlighting the interconnected nature of upper and lower airway conditions and opportunities for early identification and prevention.

10:09 am – 10:15 am
Wearable sleep monitoring links sinus surgery to improved sleep architecture
Jamie Oliver, MD
Cole Bird, MSCR
Rahul Alapati, MD
Angela Kaczorowski-Worthley, BSN
David Beahm, MD
Vidur Bhalla, MD
Frank Materia, PhD, MHS
University of Kansas Medical Center

Introduction:
Chronic rhinosinusitis (CRS) is frequently associated with impaired sleep quality. Prior studies have relied mainly on patient-reported measures, leaving the physiologic impact of sinus surgery on sleep architecture unclear. Objective data on postoperative sleep changes are limited. Using wearable sleep-staging linked to the All of Us Research Program, we evaluated within-person changes in nightly sleep patterns before and after sinus surgery.

Methods:
Adults with CRS who underwent sinus surgery were identified using an OMOP-based computable phenotype. Fitbit-derived nightly sleep metrics—including minutes asleep, deep sleep, light sleep, REM sleep, and wake/restless indices—were analyzed across 12-month pre- and postoperative windows. Linear mixed-effects models with participant-level random intercepts quantified within-person changes, and winsorization addressed device-related outliers.

Results:
Thirty surgical participants contributed 3,800 nights of sleep data across both windows. Postoperatively, total nightly sleep decreased by ~8 minutes (330 vs 322, p=0.0095). Deep sleep increased by ~7 minutes, a 14.9% rise (40.2 vs 47.2, p<0.0005). REM sleep increased by ~12 minutes, a 22% rise (53.4 vs 65.0, p<0.0005). These shifts indicate improved physiologic sleep quality despite slightly reduced total duration.

Conclusion:
Wearable-derived sleep staging demonstrates an association between sinus surgery and postoperative improvements in sleep architecture. Objective monitoring revealed significant increases in deep and REM sleep, underscoring the value of wearable technology for characterizing recovery. Prospective studies should determine how objective metrics may help identify patients who benefit most.

10:16 am – 10:22 am
Virtual intraoperative CT with dynamic anatomic updates during ESS
Graham Harris, BA
Nicole Gunderson, BS
Jeremy Ruthberg, MD
Pengchen Chen, MS
Eric Seibel, PhD
Randall Bly, MD
Waleed Abuzeid, MD
University of Washington

Background:
Incomplete dissection during endoscopic sinus surgery (ESS) may lead to revision ESS. Image-guided surgery (IGS) systems use static preoperative CT images where the displayed anatomy diverges from the reality of the surgical field as ESS progresses. We describe a computer vision-based algorithm that generates virtual intraoperative CTs (viCT) with dynamic anatomic updates using only the video from standard 2D endoscopes.

Methods:
Cadavers underwent bilateral ESS with CT imaging performed preoperatively and at 3 stages (post-maxillary antrostomy, post-total ethmoidectomy, and postoperatively). Endoscopic video was fed into a Neural Radiance Fields-based pipeline to generate 3D scene reconstructions. Reconstructions from each surgical stage were registered with the preoperative CT and a novel automated algorithm used to “delete” areas of surgical resection. These viCTs were compared to ground-truth CT from each surgical stage.

Results:
viCTs were generated bilaterally at 3 surgical stages in 4 cadavers (n=24). Mean Hausdorff distance across all stages for all cadavers between the viCT and corresponding ground-truth CT was 5.0096 ±0.8830 mm. Mean Chamfer distance was 0.0005 ±0.0003 mm indicating minimal global surface discrepancy and mean Dice Similarity Coefficient was 0.9996 ±0.0002 indicating precise spatial overlap between the viCT and ground-truth CT. These results suggest highly accurate viCT algorithmic modifications.

Conclusion:
Computer vision-based viCT incorporating dynamic updates accurately reflected the extent of surgical dissection and resultant anatomic change. viCT is akin to intraoperative imaging without the downsides of the latter and, furthermore, eliminates expensive IGS tracking hardware.

10:23 am – 10:29 am
Rhinology litigation and well-being
Tanner Frahm, BS
Shiven Sharma, JD
Richard Hausman, BS
Shaun Edalati, MD
Nathan Wallace, MD
Alfred-Marc Iloreta, MD
Satish Govindaraj, MD, FARS

Introduction:
Rhinology is a high-liability subspecialty due to complex anatomy and risks of sinus and skull base surgery. Litigation burdens surgeons financially and emotionally, yet the timing and nature of well-being effects are poorly understood. We examine how litigation affects rhinologist professional well-being.

Methods:
Fifty-three ARS and AHNS rhinologists completed a survey on malpractice history, demographics, and Professional Fulfillment Index scores. Litigation characteristics (number of lawsuits, naming status, trial involvement, perceived fairness) were recorded. Logistic regression assessed predictors, and t-tests compared well-being between recent (<2 years) and distant (>2 years) litigation.

Results:
Twenty-six respondents (49%) were involved in lawsuits. Years in practice was the only significant litigation predictor (OR 1.34 per year, 95% CI 1.17–1.63, P < 0.001). Recent lawsuits (n = 6) were associated with higher burnout impact (4.17 vs 2.84, P = 0.024) and long-term emotional impact (4.33 vs 3.21, P = 0.031) compared with distant lawsuits (n = 19), while professional fulfillment, work exhaustion, and work stress were similar. Among those sued, the mean number of lawsuits was 1.92; 88.5% were specifically named, 20.8% worked with an attorney, and 8.3% went to trial. Outcomes were mostly favorable (79.2%). Perceived fairness averaged 2.96/5, and institutional support 4/5.

Conclusions:
Recent litigation was associated with greater burnout impact and emotional strain, while these effects lessened with more distant lawsuits. Professional fulfillment remained stable, suggesting resilience to litigation-related stress. The findings highlight an early period when targeted support may protect surgeon well-being.

10:30 am – 10:39 am
Q&A

Session Moderators: Sanjeet Rangarajan, MD, FARS; Bobby Tajudeen, MD, FARS

10:40 am – 10:46 am
Irreversible electroporation for the treatment of inferior turbinates
Narin Carmel Neiderman, MD MSc
Codrut Sarafoleanu
Ionut Tanase
Ulugbek Saidakramovich Khasanov
Ulugbek Nuridinovich Vokhidov
Eugenijus Lesinskas
Marius Polianskis
Abraham Abergel

Educational objective:
Understanding the potential benefits of Irreversible electroporation (IRE), a novel non-thermal tissue ablation technology, in the treatment of nasal obstruction.

Objectives:
Evaluate the safety and efficacy of applying (IRE) for inferior turbinate hypertrophy in a clinical trial

Study design:
Prospective, interventional, multicenter study.

Methods:
IRE ablation of inferior turbinates was performed in 48 adults. The procedures were performed with local anesthesia. IRE was applied to the inferior turbinates using the ENTire TM system. Postoperative pain was assessed daily for one week. Quality-of-life outcomes were evaluated using the Nasal Obstruction (NO) VAS, SNOT-22 and NOSE-12 questionnaires at baseline and 3 months post-procedure.

Results:
Forty-eight patients ages 18–64. were treated. Mean procedure time was 12 min 21sec ± 12min 40 sec, with no intraoperative or postoperative bleeding observed. Postoperative VAS score pain on day 1 ranged from 0 to 9 (2.3±2.0) and resolved by day 7. At baseline, the NO-VAS score was 69.58±19.54, the SNOT-22 score was 33.06±24.18, and the mean NOSE-12 was 74.38±13.39. At 3 months post-procedure, NO-VAS score decreased to 12.48±11.80 ($p<0.0001$), the SNOT-22 score decreased to 7.48±10.37 ($p<0.0001$), and the NOSE-12 decreased to 11.25±9.20, ($p<0.0001$).

Conclusion:
This multi-center study is the first to evaluate IRE technology for non-thermal ablation of inferior turbinates. The procedure was brief, associated with minimal postoperative pain or complications. At 3 months follow up there was a substantial improvement in subjective measures in standard quality-of-life questionnaires.

10:47 am – 10:53 am
Data-driven triage for nasal obstruction
Jamie Oliver, MD
Cole VandeVelde
Naomi Wang, MD
Michael Price, MD, PhD
Vidur Bhalla, MD
David Beahm, MD
Alexander Chiu, MD, FARS
David Rouse, MD
University of Kansas Medical Center

Objectives:
Evaluate a scheduler-captured, HIPAA-compliant triage interface collecting key information during the initial scheduling call and determine whether early predictors could improve surgical yield and access efficiency in large academic centers.

Methods:
Beginning September 2024, all new nasal obstruction referrals were entered into the interface. During the call, schedulers recorded obstruction laterality and history of nasal injury. Patients previously seen by an outside otolaryngologist (ENT) were excluded. After six months of retrospective data collection, prospective intervention began in March 2025. Recursive partitioning and regression tree analyses identified features associated with surgical candidacy. High-yield referrals were then routed directly to ENT physicians rather than the mixed advanced practice provider/physician pool.

Results:
Among 137 patients, concordance between scheduler-captured data and clinic documentation was excellent (94% for laterality, 91.5% for injury). Unilateral obstruction (OR 2.89, 95% CI 1.11–7.49, p=0.029) and age <42 (OR 2.84, 95% CI 1.11–7.31, p=0.03) were associated with surgical candidacy. Seasonal effect was noted, with lower operative rates in summer (26.5% vs 49.5%, p=0.01). System-identified high-yield referrals had higher surgical yield (53.5% vs 18.9%, p=0.0006).

Conclusions:
Collecting structured data during the initial scheduling phone call allowed identification of predictors of operative candidacy before clinical evaluation. Integrating these findings into a prospective routing workflow increased surgical yield and reduced redundant visits. Such data-driven triage can enhance patient access and provider efficiency in academic otolaryngology.

10:54 am – 11:00 am
Opioid prescription trends in septoplasty and inferior turbinate reduction
George Bebawy, BA
Anthony Bishara, BS
Anna Simone Andrawis, BS
David Herz, BS
Sean Haimowitz, MD
Andrey Filimonov, MD, PharmD
Rutgers New Jersey Medical School

Background:
Amid national opioid concerns, opioid stewardship has become emphasized across surgical specialties. Septoplasty and bilateral inferior turbinate reduction (BITR) are common otolaryngologic procedures traditionally associated with routine postoperative opioid prescribing despite effective non-opioid alternatives. This study evaluates national trends in opioid prescription rates after these procedures using a large multi-institutional U.S. database.

Methods:
We conducted a retrospective cohort analysis using the TriNetX Research Network, identifying 370,647 adults who underwent septoplasty, BITR, or combined procedures between 2013 and 2023. The primary outcome was the proportion of patients receiving an oral opioid prescription within 1-5 days following surgery. Annual prescription rates were analyzed and temporal trends assessed.

Results:
Opioid prescribing decreased significantly across all procedure groups from 2013 to 2023. Among patients undergoing combined septoplasty with BITR, opioid prescribing fell from 22.06% in 2013 to 6.87% in 2023 (69% relative reduction). For BITR alone, rates declined from 18.6% to 9.54% (49% relative reduction). For septoplasty, rates decreased from 14.98% to 9.15% (39% relative reduction).

Conclusion:
From 2013 to 2023, postoperative opioid prescription rates following septoplasty, BITR, and combined procedures declined markedly. These findings demonstrate a substantial shift toward reduced postoperative opioid use in routine ENT surgery, reflecting evolving practice patterns, guideline adoption, and stewardship initiatives. Further research should evaluate whether these reductions correspond with improved pain control, patient satisfaction, and opioid-related adverse effects.

11:01 am – 11:07 am
Mometasone rinses as an intermediary option for refractory chronic rhinitis
Justina Varghese, BA
Parth Malaviya, Mr
Akshay Prabhakar, Mr
Daniel Gorelik, MD
Sebastian Guadarrama-Sistos Vazquez, Dr
Masayoshi Takashima, MD, FARS
Omar G. Ahmed, MD, FARS
Houston Methodist Hospital

Introduction:
Nasal steroid rinses have shown superior symptom control compared to sprays in chronic rhinosinusitis patients. However, literature on the impact of steroid rinses in chronic rhinitis alone is limited. We retrospectively examined the effects of steroid rinses in chronic rhinitis patients who failed other medical management.

Methods:
A retrospective chart review was conducted on patients with chronic rhinitis (mixed, allergic) who were prescribed mometasone nasal rinses after failing conventional treatments (intranasal steroids, oral antihistamines, saline rinses). Patients with concurrent sinusitis were excluded. Nasal symptoms were assessed using a modified TNSS (mTNSS), comprising the four core symptoms and post-nasal drip, each scored 0–3 (total 0–15). A paired samples t-test analyzed mTNSS scores pre- and post-rinses.

Results:
Of 112 chronic rhinitis patients, 53 had mTNSS data; the remaining patients had subjective follow-up information. Overall, 42% improved on medical therapy. Nasal steroid rinses significantly reduced mTNSS scores from a mean of 7.06 to 3.64 (mean reduction: 3.42+/-3.68, $p<0.0001$, n=53) with an average symptom improvement time of 1.9 months. 14% of patients proceeded to procedural interventions. All patients with improvement achieved initial resolution after one prescription, with 30% continuing prescriptions for maintenance.

Conclusions:
Among chronic rhinitis patients who failed traditional therapy, there was a significant reduction in mTNSS scores post-rinses, with nearly half of all patients having symptom improvement at <2 months. Steroid rinses should be considered an intermediate step before procedural interventions in patients with refractory chronic rhinitis.

11:07 am – 11:13 am
Q&A

11:15 am – 11:55 am
Panel: Best Bench Research of the 20s: Impact on Patient Care for the Next 20 Years
Moderator: Carlos Ebert, Jr., MD, FARS
Panelists: Anthony Del Signore, MD, FARS; Adam Kimple, MD, FARS; Joshua Levy, MD, FARS; Erin Lopez, MD, FARS

11:55 am – 12:00 pm
Thank you and see you in LA
Amber Luong, MD, PhD, FARS, and Marc Dubin, MD, FARS

Sunday, April 26, 2026
Breakout Room
Convention Center, 102 ABC
8:00 am – 11:13 am MST

Room Moderator: Benjamin Bleier, MD, FARS

Session Moderators: Nyssa Farrell, MD, and Mathew Geltzeiler, MD, FARS

8:00 am – 8:06 am
Success of anterior ethmoidal artery flaps for nasal septal perforation repair: A systematic review
Hemali Shah, MD
Ethan Tsao, Medical Student
Alhan Sayyed, Medical Student
C. Scott Dorris, Associate Director of Research Services
John Craig, MD, FARS
Daniel Spielman, MD
Georgetown University Hospital – MedStar

Objectives:
Nasal septal perforation (NSP) repair using the anterior ethmoidal artery (AEA) flap is an emerging endoscopic technique. This systematic review aimed to provide a comprehensive overview of the AEA flap technique, its variations, and its efficacy in repairing NSPs.

Methods:
MEDLINE, Embase, CENTRAL, and Web of Science were searched for terms pertinent to NSP and AEA flaps, adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines from 1946-2024, yielding 2,013 results. Animal and cadaver studies, editorials, abstracts, and studies that did not address NSP repair with surgical flaps were excluded. After full-text review of 156 studies, 15 were included.

Results:
A total of 243 patients were captured (217 adults, 26 pediatric). For adults, 169 patients underwent the original AEA flap technique with (N=68) or without

(N=101) an interposition graft, such as tragal cartilage, acellular dermal, or porcine collagen grafts. All pediatric and 48 adult patients underwent various modified AEA flap techniques. For the original AEA flap, mean reported NSP size ranged from 12.8-22 mm and mean postoperative follow-up time ranged from 3-38 months. Overall, NSP closure success rate was 84.0% (N=142/169) for the AEA flap. Closure success rate was 82.4% (N=56/68) for those with an interposition graft, and 85.1% (N=86/101) for patients without a graft (p=0.63, Cramer's V=0.04). Two patients with successful closure required intervention to reduce flap bulk postoperatively.

Conclusion:
With an overall closure success rate of 84%, the AEA flap is a reliable endoscopic technique for repairing NSPs. Emerging AEA flap modifications may further improve outcomes, and prospective studies would be beneficial.

8:07 am – 8:13 am
Impact of dysplasia on inverted papilloma recurrence
Peter Giannaris, BS
Tristan Tham
Eric Giannaris
Alexis Kim
Hannah Lee
Brendan Plann-Curley
Judd Fastenberg, MD
Mark Chaskes, MD
Charles Tong, MD, FARS
Northwell Health

Background:
Sinonasal inverted papilloma (IP) is a benign but locally aggressive tumor that has demonstrated a propensity to recur. Multiple anatomic and surgical factors have been proposed to influence recurrence, dysplasia has recently emerged as a predictor, yet its prognostic significance remains unclear. Clarifying its role may improve postoperative risk stratification.

Methods:
A systematic review and meta-analysis were performed following PRISMA guidelines and registered with PROSPERO. PubMed, Embase, Scopus, and Web of Science were queried for studies reporting recurrence outcomes stratified by dysplasia status. Studies with extractable recurrence data for dysplasia and no-dysplasia IP were included. Fixed-effects meta-analysis was performed using the Inverse Variance method to calculate pooled odds ratios (OR) with 95% confidence intervals (CI). Heterogeneity was assessed using I^2 and Cochran's Q statistics.

Results:
Twelve studies comprising 1,629 patients were included. Based on reported data, mean age was 55.4 years (SD: 2.0; 7 studies, n=1,034). The cohort was predominantly male (876/1,304; 67.2%; 9 studies). A total of 283 patients had dysplasia, 104 of which were recurrent, and 1,346 patients were without dysplasia, with 409 being recurrent. Dysplasia was significantly associated with increased recurrence risk (pooled OR 2.39; 95% CI, 1.74–3.29; $p<0.001$) with low–moderate heterogeneity ($I^2=36.8\%$). Mean follow-up was 39.8 months.

Conclusion:
Dysplasia is a significant independent predictor of recurrence in IP, conferring 2.4-times increased odds of recurrence. Standardized dysplasia reporting and risk stratification protocols are needed to optimize surveillance strategies in IP patients.

8:14 am – 8:20 am
Complication rates following modified endoscopic Denker's approach
Yasser Almansour , Medical Student
Lane Donaldson, Resident
Khaled Kashlan
Jun Jin
John Craig, MD, FARS

Background:
The modified endoscopic Denker's (MED) approach provides access to all maxillary sinus (MS) walls for resection of various MS and retromaxillary pathologies, while preserving the pyriform aperture. This study determined complication rates following EDA and MED.

Methods:
A prospective series was conducted on all adults who underwent MED for different MS or retromaxillary pathologies over 7 years. The following data were collected at all postoperative visits: epiphora, hypesthesia (teeth,upper lip,lateral nasal sidewall,cheek), crusting, internal or external nasal valve (NV) static and/or dynamic collapse, and empty nose syndrome 6-item questionnaire (ENS6Q). Patients were followed for minimum 2 years, or until hypesthesia resolved.

Results:
Of 52 MED patients, median age was 57.5 years, and 55.8% were male. Overall, 22/52 (42.3%) experienced epiphora postoperatively, and 4/52 (7.7%) did not resolve. For the 19 patients whose epiphora resolved, it did so by a median 61 days postoperatively. Sites of initial postoperative hypesthesia included teeth (23-50%), upper lip (42%), nasal (22%), and cheek (30%). Hypesthesia resolved in 88-100% of patients by a median 89.5-167.0 days. Hypesthesia only persisted in some incisors, canines, and first premolars (4-12%), and upper lip (2%). Crusting resolved in 97.8% by a median 91.0 days. No patients developed NV collapse, nor did any develop ENS (median postoperative ENS6Q=2.3; range=0-8).

Conclusions:
Following MED, patients frequently experienced temporary epiphora and orofacial hypesthesia. Epiphora persisted in 7.7% of patients, and most hypesthesia sites resolved by 3-6 months postoperatively. No patients developed NV collapse or ENS.

8:21 am – 8:27 am
Early endoscopic closure as a new paradigm for traumatic skull base dural injury
Jessica Grayson, MD
Madeline Bald
Kristen Riley
Justin Turner, MD, FARS
Do-Yeon Cho, MD
Bradford Woodworth, MD, FARS
University of Alabama at Birmingham

Background:
Conservative management of traumatic skull base cerebrospinal fluid (CSF) leaks originated when craniotomy was the only operative option and carried significant morbidity. Observation, bed rest, lumbar drainage, and delayed repair became standard despite evidence of up to a 30% long-term risk of ascending meningitis. Unlike many centers that trial observation for small dural defects or limited pneumocephalus, we employ a proactive strategy: any clinical or radiographic evidence of dural violation prompts early endoscopic repair once the patient is medically cleared.

Methods:
Traumatic skull base defects treated at our tertiary center were reviewed. Non-traumatic defects were excluded. Early endoscopic repair was performed when clinical or radiographic evidence of dural violation was present, regardless of size, including minimal pneumocephalus or subtle CSF rhinorrhea. Demographics, closure rates, complications, and revisions were analyzed.

Results:
Patients (n=310) had a mean age of (43 ± 12 years). Primary success—defined as complete cessation of CSF leak and radiographic resolution of pneumocephalus—was achieved in 96% of patients. Secondary endoscopic intervention resulted in a 99% overall success rate. Three patients ultimately required free tissue transfer;all had failed prior craniotomy attempts before endoscopic failure. Twelve patients presented with recurrent CSF leak and/or meningitis after prior conservative management, illustrating the risk of nonoperative strategies.

Conclusion:
Conservative management of traumatic skull base defects exposes patients to preventable complications. Our findings support a paradigm shift toward routine early endoscopic repair of all radiographically evident dural injury.

8:28 am – 8:32 am
Q&A

Session Moderators: Patricia Loftus, MD, FARS; Chirag Patel, MD, FARS

8:33 am – 8:39 am
NO2 and O3 exposure in sinonasal inverted papilloma recurrence and tumor extent
Jonathan Wang, MSE
Stefany Lazieh, Medical Student
Mohammed Ullah, Medical Student
Cole Brokamp, Associate Professor of Pediatrics
Nyall London, MD, FARS
Murugappan Ramanathan, MD, FARS
Johns Hopkins University School of Medicine

Background:
Sinonasal inverted papilloma (IP) is a benign yet aggressive tumor with a high recurrence rate. Nitrogen dioxide (NO2) and ozone (O3), pollutants linked to epithelial inflammation and remodeling, may influence IP behavior. This study evaluated associations between ambient NO2/O3 exposure with IP recurrence, tumor features, and surgical outcomes.

Methods:
Patients diagnosed with IP by a rhinologist at a tertiary academic center from 2013–2016 were included. Residential NO2/O3 exposure (ppb) were estimated using ZIP code-level data from NASA's Socioeconomic Data and Applications Center and averaged over intervals from 3-month to 5-years preceding diagnosis. Logistic regression assessed associations with tumor location, recurrence, and surgical outcomes, adjusting for age, sex, race, tobacco/alcohol use, and insurance type.

Results:
Among 156 patients (mean age 55±13.5 years; 64.7% male), 113 had complete NO2 /O3 exposure data. Higher NO2 exposure was associated with increased odds of recurrence at 6-month (aOR 1.07, CI: 1.01-1.14, p=0.012), 9-month (aOR 1.07, CI: 1.01-1.14, p=0.014), and 1-year (aOR 1.08, CI: 1.01-1.14, p=0.014) averages. 5-year NO2 exposure was linked to bilateral tumor location (aOR 1.25, CI: 1.02–1.54, p=0.034). Higher O3 exposure over 1-year (aOR 1.24, CI: 1.02–1.51, p=0.033), 3-year (aOR 1.41, CI: 1.07–1.87, p=0.016), and 5-year (aOR 1.50, CI: 1.09–2.08, p=0.014) averages were associated with recurrence. A 5-year O3 average was also associated with skull base involvement (aOR 1.53, CI: 1.00–2.35, p=0.049).

Conclusions:
Elevated NO2/O3 exposure correlated with greater IP recurrence risk and tumor invasiveness, underscoring the potential role of air pollution in disease progression and outcomes.

8:40 am – 8:46 am
Post-diagnosis statin use is associated with improved survival in nasopharyngeal carcinoma
Abdulghafoor Alani, BS
Emma Anisman
Anika Walia, Research Fellow
Daniel Uralov, MD
Marc Rosen, MD, FARS
Mindy Rabinowitz, MD, FARS
Elina Toskala, MD, PhD, FARS
Gurston Nyquist, MD, FARS

Nasopharyngeal carcinoma (NPC), often associated with Epstein–Barr virus and characterized by immunoevasive tumor biology. Statins are primarily prescribed for hyperlipidemia, emerging preclinical studies demonstrate their ability to influence the tumor immune microenvironment. Statins inhibit the mevalonate pathway, which reduces prenylation of oncogenic proteins, enhances T-cell infiltration, and downregulates PD-L1 expression. These immunomodulatory and antitumor effects support investigation of statins as adjunctive oncologic agents. This retrospective cohort study used the TriNetX Research Network. Adult patients with a diagnosis of NPC were included. Two cohorts were defined: patients who initiated statin therapy at least 1 day after diagnosis and patients with no statin exposure. Propensity score matching (1:1) controlled for age, sex, race, comorbidities, and cancer-specific treatment variables. Kaplan–Meier analyses compared 1-, 3-, and 5-year overall survival (OS), with log-rank testing and hazard ratios (HRs) reported. A total of 11,880 patients were included after matching (5,940 statin users and 5,940 non-users). Statin use was associated with significantly improved overall survival at all evaluated time points. One-year OS was 90.00% in statin users compared with 81.55% in non-users ($p < 0.0001$). Three-year OS was 82.25% vs 68.87% ($p < 0.0001$), and five-year OS was 75.15% vs 61.28% ($p < 0.0001$). Hazard ratios demonstrated consistent and significant reductions in mortality risk among statin users, with HRs ranging from 0.525 to 0.559. These findings are consistent with preclinical evidence of statin-mediated immunomodulation and suggest a potential role for statins as adjunctive therapy in NPC. Prospective trials.

8:47 am – 8:53 am
ctDNA for disease monitoring in sinonasal malignancies
Sharon Kim, MD
Robin Powszok, Dr.
Brian Yee
Kyle Lev
Wilson Lao
Nikhil Joshi
Michael Jelinek
Peter Papagiannopoulos, MD
Bobby Tajudeen, MD, FARS
Pete Batra, MD, FARS
Peter Filip, MD, FARS
Rush University Medical Center

Introduction:
Sinonasal cancers (SNCs) represent <5% of head and neck cancers, and diagnosis and surveillance remain challenging. ctDNA offers promise for detecting residual or recurrent disease, but research in SNCs is limited. This study evaluates ctDNA assay (Signatera) in patients with SNCs undergoing surgery and/or chemoradiation (CRT).

Methods:
A retrospective review was performed on patients with SNCs who received ctDNA testing. Diagnostic performance was assessed across all patients with baseline samples, using clinical examination and contemporaneous imaging as the reference standard. Survival analyses were performed in patients who received surgery with adjuvant CRT.

Results:
SCC comprised over half the cohort. 71 ctDNA tests were analyzed. Overall sensitivity was 82.4%, specificity 90.0%, PPV 95.5%, and NPV 66.7%. At baseline (n=8), sensitivity was 87.5% and PPV 100%. At 1-month postop, positive ctDNA was associated with worse OS (log-rank $p = 0.68$), with ctDNA-positive patients demonstrating 83.3% survival within 1 year. At 3 months post-adjuvant therapy, positive ctDNA was associated with worse OS (log-rank $p = 0.22$), with ctDNA-positive patients showing 50% survival at 2 years. Although these findings did not reach statistical significance, they were likely underpowered given the small sample size. In the CRT subgroup (n=3), limited sampling prevented meaningful calculations.

Conclusion:
ctDNA testing showed strong overall performance in detecting persistent disease. Postoperative ctDNA positivity may track with worse overall survival, a nonsignificant pattern likely limited by small sample size. Despite limitations, findings support ctDNA as a feasible and valuable complementary surveillance tool in SNC.

8:54 am – 9:00 am
Skull base involvement predicts late recurrence in olfactory neuroblastoma
Alexandria Harris, MS, MD
Garret Choby, MD, FARS
Anthony Tang
UPMC

Background:
Olfactory neuroblastoma (ONB) exhibits unique recurrence patterns, with late recurrences occurring years after treatment. However, little is known regarding characteristics that predict early vs. late recurrence patterns.

Methods:
From a multi-institutional cohort of 258 ONB patients treated at 9 centers, we analyzed 80 patients with documented recurrence. Using a 48-month cutoff based on mean recurrence time (47.7±41.3 months), we evaluated 35 clinical, anatomic, and treatment variables using Firth penalized regression across three comparisons: (1) late versus early recurrence timing, (2) late versus no recurrence, and (3) early versus no recurrence.

Results:
At 48-months, 34/80 (42.5%) recurrences were classified as late. Among recurrent patients, smaller tumor volume (OR 0.264, p=0.045) and lower Novel Dulguerov staging (OR 0.822, p=0.042) predicted later recurrence timing. Skull base bone involvement was the only predictor distinguishing late recurrence from none (OR 2.68, 95% CI 1.06-7.92, p=0.036). This effect remained significant in multivariable models adjusting for tumor volume (OR 3.41, p=0.043) and Novel Dulguerov staging (OR 3.61, p=0.019). While skull base involvement correlated with larger tumors (p<0.001) and higher stage (p<0.001), it did not predict recurrence timing (p=0.927), revealing a distinct biological mechanism independent of traditional markers.

Conclusions:
A 48-month cutoff stratifies ONB recurrence risk. Skull base bone involvement independently predicts late recurrence versus none, necessitating extended surveillance beyond 5 years even in patients with favorable characteristics. These findings establish skull base involvement as a novel biomarker for risk-stratified surveillance.

9:01 am – 9:04 am
Q&A

9:05 am – 9:30 am
Panel: Training the World: International Fellowship Training
Moderator: Do-Yeon Cho, MD
Panelists: Catherine Banks, MD; Andy Chua, MD, FARS; Peter Hwang, MD, FARS, Camilo Reyes, MD, FARS
Sponsored by the International Committee

9:31 am – 10:01 am
Break with Exhibitors

Session Moderators: Ashleigh Halderman, MD, FARS; Chadi Makary, MD, FARS

10:02 am – 10:08 am
Modeling age-dependent olfactory function in human olfactory organoids
Randy Bach
Ankit Chauhan, Post-Doctoral Researcher
Michael Xiang
James Palmer, MD, FARS
Nithin Adappa, MD, FARS
Noam Cohen, MD, PhD, FARS
Michael Kohanski, MD, FARS
Jennifer Douglas, MD, FARS

Background:
Olfactory dysfunction (OD) is characterized by loss or alterations in the sense of smell and has an age-related increase in prevalence. Murine models have demonstrated stable expression of olfactory receptors in the olfactory epithelium (OE) over time, pointing towards OE cell density as a potential driver in age-related OD. Since developmental changes in human OE remain poorly characterized, assessing its structure and function across the lifespan is critical to understanding normal maturation and age-related degeneration.

Methods:
Superior turbinate biopsies from pediatric and adult patients were obtained for the culture of three-dimensional olfactory organoids. Immunofluorescence (IF) and reverse transcriptase quantitative polymerase chain reaction (RT-qPCR) were performed to confirm the presence and gene expression of expected OE cell types. Live-cell calcium imaging was performed to assess organoid response to odorants, a surrogate of function.

Results:
IF confirmed pediatric and adult organoids contain major OE cell populations (e.g., horizontal and globose basal cells, sustentacular cells, and immature and mature olfactory sensory neurons). There was no statistical difference in OE cell gene expression between pediatric and adult tissue. Calcium imaging demonstrated no significant difference in odorant-evoked responses (peak amplitude, area under the curve).

Conclusion:
Human OE appears structurally, transcriptionally, and functionally stable across the lifespan. Further research is needed to better understand age-related OD, which may stem from non-OE-derived changes.

10:09 am – 10:15 am
Highly-effective modulator therapy and olfactory-specific gene expression in Cystic Fibrosis
Michael Xiang, BA, MA
Ankit Chauhan, Post-Doctoral Researcher
Randy Bach, BS
Margaret Mitchell, MD
Vidit Talati, MD
Nithin Adappa, MD, FARS
James Palmer, MD, FARS
Noam Cohen, MD, PhD, FARS
Michael Kohanski, MD, FARS
Jennifer Douglas, MD, FARS

Background:
Chronic rhinosinusitis is common in patients with cystic fibrosis (PwCF). Highly-Effective Modulator Therapy (HEMT) has been shown to improve sinonasal outcomes. However, prior studies have failed to show an improvement in objective olfaction with HEMT use. Furthermore, the underlying molecular pathophysiology behind olfactory dysfunction in PwCF remains poorly understood.

Methods:
Single-center prospective cohort study of PwCF. Patients with no history of CF or co-morbid sinus disease were used as controls. Olfactory-specific QOL (QOD-NS) and objective olfactory testing (Brief Smell-Identification Test [B-SIT]) were collected. Cytology brushings from the olfactory epithelium (OE) were obtained to isolate RNA for olfactory-specific gene expression (OMP, TUJ1, SOX2, KRT5, OR5AN1, and OR9K2).

Results:
14 PwCF were enrolled (HEMT n = 6, non-HEMT n = 8, control n = 8). No significant difference was found in olfactory specific QOL or objective olfaction by HEMT status. Among PwCF on HEMT, there was no significant association between B-SIT score and HEMT age of initiation. There was a significant difference between PwCF and controls for SOX2 gene expression (p=0.0033), however no difference by HEMT status or among other genes.

Conclusion:
HEMT use does not appear to be associated with objective olfaction in PwCF. Gene expression of OE support cells may be altered in PwCF but does not appear to be impacted by HEMT status. Further studies are necessary to better understand CF-induced changes to the OE.

10:16 am – 10:22 am
Inflammatory mediators of anosmia in chronic rhinosinusitis
Shvetali Thatte, BS
Mark Liu
Mohamad Chaaban, MD, FARS
Case Western Reserve University School of Medicine

Introduction:
Anosmia in chronic rhinosinusitis (CRS) significantly impairs quality of life. This study evaluates associations between nasal cytokines and both baseline anosmia severity and postoperative olfactory recovery.

Methods:
This prospective study (2021–2024) included patients with CRS undergoing functional endoscopic sinus surgery (FESS). The SNOT-22 olfactory sub-score measured baseline olfaction and postoperative improvement by 12 months. Intraoperative nasal cytokines were quantified. Baseline anosmia and olfactory improvement (Δ) were compared between CRS with nasal polyps (CRSwNP) and without polyps (CRSsNP). Spearman correlations assessed cytokine associations.

Results:
88 patients were included (59 CRSwNP, 29 CRSsNP). Baseline anosmia severity was similar between the groups. By 12 months, recovery in olfaction was significantly greater in CRSwNP (median Δ3.0) compared with CRSsNP (median Δ1.5, p=0.03). In CRSsNP, baseline anosmia correlated with IL-4, IFN-γ, and angiogenic factors (FGF-2, PDGF-BB, VEGF-A, TNF-β) (p≈0.01–0.05). In CRSwNP, anosmia correlated with IL-27, IL-6, IL-10, and IL-9 (p≈0.004–0.04). Postoperatively, in CRSsNP, higher VEGF-A correlated with greater recovery in olfaction while increased IL-9 impaired recovery (p=0.04). In CRSwNP, higher IL-27 correlated with greater improvement while increased VEGF-A impaired recovery (p≈0.02–0.04).

Conclusion:
Despite similar baseline anosmia, postoperative olfactory recovery was greater in CRSwNP. CRSsNP demonstrated mixed Type 1/Type 2 inflammation and angiogenic signaling while CRSwNP exhibited a mixed inflammatory profile with IL-9 as the principal Type 2-associated cytokine, suggesting distinct inflammatory drivers of anosmia in each group.

10:23 am – 10:29 am
Olfactory and gustatory function in diabetes mellitus: A prospective clinical study
Narin Carmel Neiderman, MD, MSc
Elinoy Herstain, Research Student
Tom Fischer
Idan Peled, Dr
Ella Hazan
Hen Chaushu
Assaf Buch
Yael Sofer
Abraham Abergel
Roy Eldor

Background:
Diabetes mellitus (DM) has been linked to peripheral neuropathy and subtle sensory deficits. Several antidiabetic medications, are explored for their potential to influence taste perception. Whether DM itself causes primary olfactory or gustatory impairment remains unclear. This study aims to compare smell and taste performance between adults with and without DM.

Methods:
25 adults without rhinology comorbidities (17 with DM and 8 without DM) underwent comprehensive chemosensory evaluation. Olfaction was assessed using Sniffin' Sticks threshold (T), discrimination (D), and identification (I) subtests and the University of Pennsylvania Smell Identification Test (UPSIT). Gustation was evaluated with a 16-strip taste test assessing four taste qualities across multiple dilutions. Participants completed validated quality-of-life instruments: He-NOSE, He-SNOT-22, He-QOD, He-MOQ, WHO-5, and PANAS.

Results:
There were no significant differences in age, gender, or overall TDI performance (all p>0.2). All QOL instruments showed no between-group differences. WHO-5 scores demonstrated borderline higher well-being among DM participants (14.94±5.79 vs. 10.38±4.10; p=0.06). UPSIT scores were significantly lower in DM patients (27[26–31] vs. 30.5 [28.75–32.25]; p=0.05). No differences were found in total TDI or taste-strip scores. DM participants demonstrated a significantly higher tendency to misidentify taste items as "bitter" (p=0.02).

Conclusion:
Despite similar global olfactory performance, DM patients exhibited selective chemosensory vulnerabilities: lower UPSIT scores and a biased bitter-misidentification, suggestive of subtle differences in smell and taste perception that may be part of generalized nutritional pathway.

10:30 am – 10:39 am
Q&A

Session Moderators: Anthony Del Signore, MD, FARS; Carol Yan, MD

10:40 am – 10:46 am
Repurposing azelastine for viral infection prophylaxis: Insights from a retrospective cohort study
Jonathan Vuillier, BS
Cassie Bowers, BS
Cristofer Barry, MA
Gavin McCabe, BS
Sean Kelso, BS
Adedoyin Kalejaiye, MD
Jonathan Walsh, MD

Objective:
Preclinical trials have shown that Azelastine exhibits intrinsic antiviral activity in human cell and tissue models, and a recent Phase-2 RCT showed reduced COVID-19 and RSV incidence when used as prophylaxis. Our study builds on this evidence and provides the first large, population based real-world study assessing Azelastine's potential as prophylaxis in clinical practice.

Methods:
We conducted a retrospective cohort study using TriNetX, containing deidentified EHR data from 110 million patients. We built cohorts using patients ≥18 years with allergic or vasomotor rhinitis and whether or not they received an Azelastine prescription, excluding immunocompromised status and recent positive viral serology. 1:1 matching by demographics, nasal corticosteroid use, and comorbidities was performed. Outcomes over 60 days post-index event included incidence of laboratory-confirmed COVID-19, rhinovirus, influenza A, influenza B, and RSV. Risk ratios (RR) calculations and Kaplan–Meier analysis were conducted.

Results:
Azelastine use was associated with lower incidence of COVID-19 (RR 0.79, 95% CI 0.74–0.84) and Rhinovirus (RR 0.63, 95% CI 0.50–0.78), influenza B (RR 0.85, 95% CI 0.77–0.94), and RSV (RR 0.82, 95% CI 0.72–0.94). Influenza A showed no significant difference (RR 0.91, 95% CI 0.82–1.01). Kaplan–Meier analyses demonstrated significantly lower cumulative incidence of COVID-19, rhinovirus, influenza B, and RSV among azelastine users (p<0.05).

Conclusions:
In a large national patient database, Azelastine prescription was associated with significantly reduced incidence of viral respiratory illness within 60 days after use. These findings support previous studies highlighting its potential role in prophylaxis strategies.

10:47 am – 10:53 am
Determinants of olfactory cleft deposition
Adam Kaakati, BSE
Ryan Sicard, BS
Sarah Russel, MD, MPH
Dennis Onyeka Frank-Ito, PhD

Background:
Intranasal drug delivery targeting the olfactory cleft is often influenced by substantial variability associated with both intra- and inter-individual morphology, yet drivers of this heterogeneity remain poorly understood. In this study, we examined a range of anatomical and physiological factors that correlate with unilateral olfactory deposition.

Methods:
We reconstructed subject-specific nasal models from radiographic images of 32 healthy adults with normal anatomy. For each model, we simulated steady-state resting inspiratory airflow at 15 L/min and performed intranasal spray particle transport simulations to evaluate deposition in 64 unilateral olfactory cleft regions.

Results:
Across all unilateral olfactory regions, unilateral nasal resistance demonstrated a significant moderate negative correlation with olfactory deposition ($r = –0.29$, $p = 0.02$), implying resistance-driven airflow dynamics as a key determinant of delivery efficiency. Measures of nasal asymmetry also contributed meaningfully to intra-individual variability: side-to-side differences in airway resistance ($r = –0.32$, $p = 0.07$) and differences in airway surface area ($r = 0.31$, $p = 0.09$) showed the strongest associations with variation in deposition. Several geometric variables, such as airway and olfactory volume, olfactory surface area, and airflow partitioning, showed only modest, nonsignificant associations.

Conclusion:
Collectively, these findings highlight nasal airway resistance and nasal asymmetry as the strongest contributors to inter- and intra-individual variability in olfactory cleft deposition, while also underscoring the influence of anatomical differences that modulate airflow pathways into the olfactory region.

10:54 am – 11:00 am
Azelastine reduces ARS episodes in RARS patients: A retrospective cohort study
Akshay Prabhakar, BSA
Justina Varghese
Utkarsh Singh
Jake Hacker
Yixuan James Zheng, Dr
Chadi Makary, MD, FARS
Masayoshi Takashima, MD, FARS
Omar G. Ahmed, MD, FARS
Houston Methodist Hospital

Introduction:
A recent randomized controlled trial demonstrated that azelastine nasal spray reduced SARS-CoV-2 infections by 67%, highlighting its antiviral properties. Given that acute rhinosinusitis (ARS) often originates from viral infections, we investigated whether azelastine reduces ARS episode frequency in patients with recurrent acute rhinosinusitis (RARS).

Methods:
Retrospective cohort study of adult RARS patients who initiated azelastine nasal spray at a single academic center. Patients required documented RARS diagnosis ≥1 year before azelastine initiation. ARS episodes were identified through a chart review of clinical encounters. Episodes separated by ≥14 days of symptom resolution were counted as distinct. Matched observation periods (12-24 months per patient) before and after azelastine were analyzed. Episode frequency was normalized to episodes per year and compared using paired t-tests.

Results:
Among 153 patients (mean age 59 years; 74% female; 44% allergic rhinitis; 22% asthma), annualized ARS episodes decreased from 2.40±1.24 pre-treatment to 1.03±0.92 post-treatment (mean difference: -1.38 episodes/year, 95% CI: -1.53 to -1.22, $p<0.001$), representing a 57% reduction. 86% experienced fewer episodes; 23% achieved complete resolution. Results remained significant when controlling for concomitant nasal sprays or oral antihistamines in the post-treatment window and were consistent across subgroups including sex, allergic rhinitis status, and baseline disease severity.

Conclusion:
Azelastine nasal spray was associated with significant ARS episode reduction in RARS patients. These findings support azelastine's potential as prophylactic therapy and warrant prospective controlled trial validation.

11:01 am – 11:07 am
Q&A

Move to:
General Session – Room 105ABC
11:15 am – 12:00 pm

11:15 am – 11:55 am
Panel: Best Bench Research of the 20s: Impact on Patient Care for the Next 20 years
Moderator: Carlos Ebert, Jr., MD, FARS
Panelists: Anthony Del Signore, MD, FARS; Adam Kimple, MD, FARS; Joshua Levy, MD, FARS; Erin Lopez, MD, FARS

11:55 am – 12:00 pm
Thank you and see you in LA
Amber Luong, MD, PhD, FARS and Marc Dubin, MD, FARS

ARS Poster Viewing
Friday, April 24, 2026,
9:00 am – 7:00 pm
Saturday, April 25, 2026,
9:00 am – 2:45 pm
Phoenix Convention Center
West Building
COSM Exhibit Hall 1 & 2

ARS Combined Poster Reception
Friday, April 24, 2026
5:30 pm – 7:00 pm
Phoenix Convention Center
West Building
COSM Exhibit Hall 1 & 2

Poster# ARS001

30-day complications after FESS for CRS

Phillip Richards, MD
Ashoke Khanwalkar, MD, FARS
University of Colorado

Objective:
To characterize 30-day postoperative complication rates including epistaxis, acute sinusitis, cerebrospinal fluid (CSF) leak, and orbital hematoma following functional endoscopic sinus surgery (FESS) in patients with chronic rhinosinusitis (CRS) using a national multipayer claims database.

Methods:
A retrospective cohort analysis was performed using the PearlDiver M170 database. Patients undergoing FESS were identified using CPT codes for endoscopic sinus surgery. CRS was defined using ICD-9 and ICD-10 diagnosis codes. The primary cohort included all patients with CRS undergoing FESS, irrespective of concomitant procedures. Thirty-day postoperative complications were defined as new diagnoses of acute sinusitis, epistaxis, CSF leak, or orbital hematoma occurring within 30 days after the index FESS date.

Results:
A total of 653,279 CRS patients underwent FESS. Within 30 days of surgery, acute sinusitis occurred in 98,402 patients (15.1%), and epistaxis occurred in 14,459 patients (2.2%). CSF leak was identified in 483 patients (0.07%), and orbital hematoma in 281 patients (0.04%).

Conclusion:
In this large, real-world CRS cohort undergoing FESS, early postoperative complications were dominated by acute sinusitis and epistaxis, whereas CSF leak and orbital hematoma were exceedingly uncommon. These data provide contemporary, population-level benchmarks for counseling patients and for designing future comparative studies in endoscopic sinus surgery outcomes. Future research directions include comparative analyses of complication rates between FESS cohorts who did and did not undergo frontal sinusotomy, septoplasty, and inferior turbinate reduction.

Poster# ARS002

A decade of trends in skull base surgery outcomes

Taral Jella, BA
Tara Menon, Medical Student
Jazlyn Selvasingh, Medical Student
Neha Sonthi
Justin Shinn, Dr
Virginia Tech Carilion School of Medicine

Introduction:
Skull base surgery is a high-acuity domain within otolaryngology requiring substantial hospital resources, yet national analyses remain limited. This study evaluates decade-long trends in approach utilization, perioperative morbidity and mortality, and healthcare efficiency for skull base surgery.

Methods:
A retrospective cohort study was conducted using ACS-NSQIP (2011–2021). Patients undergoing skull base procedures were stratified into Open and Endoscopic cohorts. Trends were analyzed for operative volume, approach, and frailty (mFI-5). Primary outcomes were 30-day major complications (SSI, pneumonia, renal failure, stroke, myocardial infarction, sepsis, etc.) and mortality. Multivariable logistic regression identified independent predictors, reported as adjusted odds ratios (aOR) with 95% confidence intervals (CI).

Results:
A total of 33,458 patients were identified. Open approach increased from 73.9% to 76.3% (p=0.047). Open approach independently predicted major complications (aOR 2.84, 95% CI 2.53–3.19, p<0.001). Increased frailty (1-point increase in mFI-5) was associated with adverse outcomes (aOR 1.70, 95% CI 1.62–1.79, p<0.001). The adjusted rate of major complications remained stable (p=0.12). Efficiency improved, with mean LOS decreasing from 7.0 to 5.6 days (p=0.049).

Conclusions:
Morbidity and mortality of skull base procedures remained stable, and efficiency has improved, reflected by a 20% reduction in average LOS. Open approaches remain predominant and have nearly 3-fold higher complication risk than endoscopic techniques, independent of frailty. Enhanced recovery protocols may drive efficiency gains despite the constant physiological burden of surgery.

Poster# ARS003

A pilot evaluation of a novel smoke evacuation device in endoscopic sinonasal surgery

Corinne Stonebraker, BA
Megan Christy, BSE
Abdelrahman Ahmed, MS
Flavia Bottai
A. Michael Ierardi, MES MS CIH
Turner Baker, PhD
Lacy Brame, DO
Aisosa Omorogbe, MD
Brian Pavilonis, PhD
Raj Shrivastava, MD
Alfred-Marc Iloreta, MD
Icahn School of Medicine at Mount Sinai

Background:
Aerosolized fine particulate matter (PM2.5) in endoscopic sinonasal surgery can obscure visualization and expose surgeons and operating room (OR) staff to harmful particles. Despite recent attempts to develop smoke-capturing cautery devices, endoscopic visibility remains an operative issue. Here we present an occlusive nasopharyngeal suction prototype (NSP) to hermetically seal the nasopharynx and provide continuous evacuation to improve visualization and reduce aerosolized PM2.5 exposure.

Methods:
A 3D-printed endonasal model with surrogate tissue was placed in surgical orientation and connected to a suction circuit (15 L/min) incorporating the NSP. Checkerboard targets were placed on relevant anatomy and tools. Electrocautery was applied for one minute. Endoscopic visibility was quantified with an edge-detection algorithm using Sobel and bandpass filters. Real-time PM2.5 concentrations were recorded at one-second intervals near the operator's breathing zone using a SidePak™ AM520. Aerosolized PM2.5 exposure and visibility during NSP use were compared to a control without suction.

Results:
Mean PM2.5 concentrations were significantly lower with NSP (0.016±0.005 mg/m^3) than control (0.101±0.078 mg/m^3; p=0.003). Peak PM2.5 concentrations were significantly lower with NSP (0.034±0.023 mg/m^3) than control (1.003±0.859 mg/m^3; p=0.002). Mean visibility was significantly higher with NSP (96.7%) than control (51.5%; p<0.0001).

Conclusion:
The NSP significantly reduced aerosolized PM2.5 concentrations and enhanced visualization in simulated endoscopic sinonasal surgery. These findings support further testing of the NSP in live surgical settings as a practical approach to optimize intraoperative safety and visibility.

Poster# ARS004

A virtual reality simulator for skull base surgery validated across education stakeholders

Troy Weinstein, BSHS
Jason Zhang, Medical Student
Sameena Rahman, Medical Student
David Ahmadian, Resident
Eugene Chang, MD, FARS

Objective:
To evaluate the educational effectiveness and perceptions of a novel virtual reality (VR) skull base surgical simulator designed to address the distinct needs of trainees, educators, and industry partners.

Methods:
A prospective study was conducted with 28 participants: 15 trainees, 6 attendings, and 7 industry representatives. Participants completed pre- and post-intervention surveys after interacting with a VR tutorial module for endoscopic endonasal surgery. The simulator was developed using validated educational frameworks such as Cognitive and Hierarchical Task Analysis, and systematic human error reduction methods. Quantitative data were analyzed using non-parametric tests.

Results:
Trainees' perceived ability to visualize 3D anatomy increased by 54% (p=.004) compared to textbooks, 27% (p=.009) compared to videos, and 28% (p=.015) compared to simulation centers. Complication recognition improved by 46% (p =0.007), 33% (p= .007), and 25% (p=.024) across these same modalities, respectively. Procedural flow improved by 35% (p=.014), 13% (p=.130), and 17% (p=.034) across respective modalities. Educators showed consistent but nonsignificant directional gains across domains (p >.05). Industry respondents reported a high market demand with positive perceptions of educational alignment (75%) and clinical utility (87.5%) of the VR simulator.

Conclusion:
This stakeholder-driven VR simulator enhanced perceived learning outcomes for trainees and educators while demonstrating strong utility among industry partners. By integrating cognitive task frameworks and aligning educational and commercial priorities, VR platforms may offer scalable, cost-effective solutions to modern surgical training challenges.

Poster# ARS005

A window to the brain: Reinforcing smell testing in rhinology for early neurocognitive detection

Ibtisam Mohammad, MD
Brent Senior, MD, FARS
Emad Al Haj Ali, Assistant Professor
Kenneth Byrd, MD
Medical College of Georgia

Context:
Loss of smell is increasingly recognized as an early marker of neurodegenerative disease. Longitudinal studies show that unexplained olfactory dysfunction can more than double the risk of developing dementia, often appearing years before measurable cognitive decline. Despite this, routine olfactory testing remains uncommon in ENT practice, leaving many early cases undetected.

Objective:
To review evidence linking olfactory dysfunction with mild cognitive impairment (MCI) and Alzheimer's disease (AD) and to evaluate the role of structured smell testing in routine rhinologic care.

Methods:
Longitudinal cohort studies, neuropathologic data, and diagnostic research were examined, focusing on objective olfactory measures—odor identification, discrimination, and related testing—and their timing relative to the onset of cognitive symptoms.

Results:
Objective olfactory dysfunction consistently predicts both incident MCI and progression to AD. Many at-risk patients do not perceive or report their own smell loss, making symptom-based screening unreliable. Smell testing often identifies risk even when cognitive assessments appear normal, highlighting its value as an early, accessible biomarker.

Conclusion:
Olfactory loss is a clinically meaningful sign of possible early neurodegenerative change. Incorporating structured smell testing into routine rhinology visits—particularly for older adults or those with persistent, unexplained dysfunction—may help identify vulnerable patients sooner. With the heightened awareness of olfaction after COVID-19, routine testing represents a timely and impactful addition to rhinologic practice.

Poster# ARS 006

Adverse effects of CRS biologics

Olivia La Monte, MD
Carol H. Yan, MD
Farhoud Faraji, MD
Adam DeConde, MD

Introduction:
Monoclonal antibodies targeting type 2 inflammation are increasingly used in chronic rhinosinusitis with nasal polyps (CRSwNP), with prescribing trends shifting earlier in the disease course and in some cases preceding revision surgery.

Methods:
We descriptively synthesized treatment-emergent adverse events (TEAEs), as defined within each trial's safety analysis set, from 23 adolescent and adult randomized controlled trials (RCTs) of dupilumab (n=8), omalizumab (n=7), mepolizumab (n=5), and tezepelumab (n=3). All trials contained extractable AE tables enabling comparison of absolute AE frequencies. Because AE definitions and ascertainment varied across studies, results were summarized using raw incidence ranges.

Results:
Across indications, biologics demonstrated favorable safety profiles with reproducible, mechanism-specific AE patterns. Injection-site reactions (≈5–10%) were the most consistent drug-specific AE and exceeded placebo by ~1–3%. Dupilumab showed a distinct ocular signal, with conjunctivitis uncommon in CRSwNP and asthma but 10–20% in atopic dermatitis, reflecting a disease-modulated rather than uniformly drug-specific effect; transient, dose-independent eosinophilia occurred across trials. Omalizumab was associated with headache, arthralgia, and fatigue and carries a rare anaphylaxis risk (~0.1–0.2%). Tezepelumab demonstrated the most placebo-aligned profile with low systemic AE rates.

Conclusion:
These data show that CRS-related biologics are generally safe; however, recognizing predictable mechanism-driven and disease-modulated AEs is essential for appropriate patient selection and counseling.

Poster# ARS007

AI enhanced diagnostic endoscopy for hereditary hemorrhagic telangiectasia (HHT)

Alexandria Yao, BA
Kenan Ye
Lirit Levi, MD
Mahdokht Manavi, MD
Maxime Fieux, MD
Axel Renteria, MD
Peter Hwang, MD, FARS
Jayakar Nayak, MD, PhD
Zara Patel, MD, FARS
Noel Ayoub, MD
Michael Chang, MD
University of Kansas

Background:
Hereditary Hemorrhagic Telangiectasia (HHT) frequently presents with recurring epistaxis. HHT diagnosis can be made by endoscopy by identifying mucosal telangiectasias, and treatment typically involves focal ablation of each lesion. We developed and evaluated the performance of a deep learning model (DLM) to endoscopically diagnose HHT and localize lesions within the nasal cavity.

Methods:
We included all adult patients endoscopically evaluated for both HHT epistaxis and non-HHT epistaxis at Stanford between 2013-2025. Images were annotated and verified by three clinicians. For diagnosis of HHT versus non-HHT, we built a classification model using MedSigLIP encoder and a ResNet-18 architecture. For localization, we converted telangiectasia bounding-box annotations into pseudo-masks by prompting and fine-tuning the Segment-Anything-Model (SAM). Images were then tested by checking the number of predicted masks lying within the annotated bounding boxes. Images were divided into 8:1:1 ratio for training, validation, and testing.

Results:
1,880 images (1,132 HHT, 748 non-HHT) from 224 patients were used for DLM development. For diagnosis of HHT, the model demonstrated accuracy of 0.846, precision of 0.903, recall of 0.830, and F1-score of 0.865. For telangiectasia localization, the performance metrics were sensitivity of 0.755, precision of 0.500, and F1-score of 0.602.

Conclusions:
Deep learning can reliably differentiate between HHT and non-HHT epistaxis based on endoscopic images and has moderate performance in localizing telangiectasias. Future iterations can potentially serve as diagnostic aids for clinicians and assist in identification of lesions during ablative treatment.

Poster# ARS008
AI for sinusitis clinician and patient education
Emily Kwon, BA
Annie Xu, BS
Sean Haimowitz, MD
Brandon Gold, MD
Rachel Kaye, Dr
Wayne Hsueh, MD
Rutgers New Jersey Medical School

Background:
Large language models are being used to answer clinical questions, thus becoming important resources for clinicians and patients. In 2025, the American Academy of Otolaryngology-Head and Neck Surgery released Clinical Practice Guideline (CPG): Adult Sinusitis Update. We compared artificial intelligence (AI) chatbot responses to queries extrapolated from the CPG statements as a toolkit in physician and patient education.

Methods:
Thirty-one clinical queries were derived from the executive and plain-language CPG and entered into ChatGPT, Microsoft Copilot, Google Gemini, and OpenEvidence. Physician raters, blinded to source, evaluated responses for accuracy, comprehensiveness, patient-level appropriateness, and patient safety with a 5-point Likert scale against the CPG.

Results:
For physician-directed questions, no significant differences were found across platforms except higher comprehensiveness for Gemini vs Copilot (4.12 vs 3.35, $p<0.05$). ChatGPT had the highest accuracy (4.00) and safety (4.41), and Gemini the highest comprehensiveness (4.12).

For patient-directed questions, Gemini had the highest comprehensiveness (4.36, $p<0.05$), but lowest patient level appropriateness (3.00, $p<0.05$). ChatGPT and Copilot showed no differences across all domains. ChatGPT had the highest accuracy (4.29) and patient level appropriateness (3.86), but lowest comprehensiveness (3.50).

Conclusion:
There are variations in the accuracy, comprehensiveness, and patient-level responses between popular AI models. ChatGPT and Gemini were the most consistent with the CPG across multiple domains. Further studies should determine how patients and physicians may best use these models for the diagnosis and management of sinusitis.

Poster# ARS009
AI tools in clinical research
Randall Ow, MD, FARS
Allyson Ikeda
Denise Willoughby
Taylor Nunes
Raman Pannu
DaVinci Research

Patient screening and recruitment are major bottlenecks in clinical research efficiency, particularly for studies with complex inclusion and exclusion (IE) criteria or large patient pools. Artificial intelligence (AI) may overcome this challenge by automating the parsing of medical records to assess patient eligibility, thereby accelerating enrollment timelines, and reducing coordinator workload. To evaluate this potential, we leveraged a large language model-based AI tool that automatically redacts all protected health information from uploaded patient records and generates citations based on the data to support patient relevance and eligibility. In this pilot trial, actual medical records were uploaded and automatically assessed against imported IE criteria. Citation reliability was validated through manual comparison of each citation to its reference source file and demonstrated high specificity and accuracy. These findings suggest that AI is a reliable and efficient tool to assist recruitment, and can be further optimized with broader data access, such as electronic medical record integration. The tool can be scaled for large target populations or multi-site recruitment, reducing chart review time, the number of screen-fails and/or selection of poorly matched participants, improving site efficiency. Broader access can also enhance diverse patient population recruitment, a critical flaw in the current research environment. As HIPAA compliance standards evolve with the introduction of AI, we will explore how the practical features of this new technology can improve pre-screening efficiency and efficacy

Poster# ARS010

AI-assisted development of a computer adaptive SNOT-22 using item response theory

Elena Quinonez Del Cid
Katrina Bootes
Anna van Dorsten
Kees Heetderks
Nikhita Tsambasis
Nathan Barefoot, Medical Student
Priya Desai
Brian Thorp, MD, FARS
Charles Ebert, MD, FARS
Brent Senior, MD, FARS
Adam Kimple, MD, PhD, FARS

Introduction:
Patients with chronic rhinosinusitis (CRS) experience considerable survey burden, hindering willingness to provide accurate and complete responses on surveys such as the SNOT-22. Computer adaptive testing (CAT) using item response theory (IRT) may provide a path to shorten the SNOT-22 without significantly compromising measurement precision for individuals. This study aimed to develop and validate a CAT model based on IRT using generative artificial intelligence (AI).

Methods:
A retrospective review (2021-2025) was conducted to assemble a database of complete SNOT-22s. Using IRT (package mirt in R), 1,403 de-identified surveys were analyzed. The CAT was validated via simulation in R with package mirtCAT with a separate set of 602 surveys. ChatGPT (GPT 5, OpenAI) was utilized for the framework and template code. AI assistance allowed for expedited model calibration; all data outputs were verified by the study team.

Results:
The novel SNOT-CAT achieved strong reliability to the full SNOT-22 (r = 0.94) with a mean of 7.6 items per adaptive survey (median 4, IQR 3-10), representing an 82% reduction in survey length. The mean absolute difference between model scores and true scores from the validated data set was 4.5. Notably, 93.7% of estimated scores fell within 8.9 points of the true score (the minimal clinically important difference).

Conclusions:
Leveraging AI for the calibration of parameters for a computer adaptive test allows for the creation of an optimized, shortened version of the SNOT-22. These methods may provide a way to effectively reduce survey response burden in patients with CRS. Future research is needed to validate this model in real-world clinical settings.

Poster# ARS011

AI-based nasopharyngeal detection and localization on brain MRI

Samuel Tercyak, Medical Student
Hrithwik Shalu
Darren Yang
Farah Hasan
Marc Cohen
Holodny Andrei
Dylan Hsu
Joseph Stember

Early detection of nasopharyngeal carcinoma (NPC) and skull base malignancies remains difficult, as subtle lesions are often missed on routine brain MRIs that incidentally include the nasopharynx. These “corner-of-the-image” findings can delay diagnosis and treatment. We developed a deep learning framework to automatically identify and analyze the nasopharyngeal–skull base region on standard brain MRIs, aiming to flag normal versus abnormal anatomy and support earlier recognition of NPC and other skull base pathology. Axial T2-weighted MRIs from 350 patients were retrospectively analyzed. The three-step pipeline included slice selection to identify axial slices containing the nasopharynx, 2D localization using a YOLOv11 model, and classification (in development) to distinguish normal from abnormal anatomy. Slice-selection predictions were benchmarked against a neuroradiologist with six years of experience for reference, with performance evaluated using mean average precision (mAP) and standard classification metrics. The YOLOv11-based localization network, trained on all 350 MRIs, achieved 97% precision, 89% recall, mAP@0.5 = 92%, and mAP@0.5:0.95 = 70%. In a proof-of-concept study of ten normal MRIs, the slice-selection model achieved 94.2% accuracy, 74.3% precision, 72.2% recall, and 96.9% specificity. Qualitative review confirmed accurate delineation of the fossa of Rosenmüller, Eustachian tube orifice, and adjacent skull base structures. This study introduces an AI framework that autonomously identifies and localizes the nasopharynx on routine brain MRIs. Early results show high accuracy in slice selection and localization, supporting its potential to improve early detection of NPC and other skull base lesions.

Poster# ARS012

AIFS and climate in the United States

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Background:
Geographic variation in allergic fungal rhinosinusitis has been described, with climate factors such as temperature and humidity implicated. While host immunocompromise drives acute invasive fungal sinusitis (AIFS), the potential environmental contribution has not been investigated. We evaluated national geographic and climate-related patterns in AIFS hospitalizations.

Methods:
We performed a retrospective analysis of the National Inpatient Sample (NIS) from 2015–2022 using ICD-10-CM codes to identify AIFS hospitalizations. Sampling weights were applied per HCUP guidelines to generate nationally representative estimates. The nine NIS hospital regions were classified according to dominant Köppen climate type. Demographics, comorbidities, and in-hospital outcomes were summarized.

Results:
A total of 345 weighted hospitalizations were identified (mean age 59 years; 70% male). Most occurred in regions with dominant Köppen Class C (Temperate) climate (61%), followed by Class D (Continental, 36%) and Class B (Dry, 3%). Type II diabetes mellitus (DM) was present in 72% of patients, including 7.2% with diabetic ketoacidosis. Average state-level DM prevalence was highest in Class C regions (11.6%), compared with Class D (9.6%) and Class B (8.9%) ($p<0.05$). Other common comorbidities included hematologic malignancies (most commonly myeloid leukemia, 22%), transplant (20%), neutropenia (16%), and primary immunodeficiencies (9%). The overall mortality was 14% (Class D 17.6%, Class C 11%, and Class B 0%).

Conclusion:
AIFS incidence was highest in regions dominated by Class C climates. These findings suggest that AIFS may be influenced by local climate factors in addition to host immunocompromise. Further research is warranted.

Poster# ARS013

WITHDRAWN

Poster# ARS014

An anatomically based biomimetic 3D-printed endoscopic high-speed bone drilling simulation

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Background:
Endoscopic skull base drilling is increasingly used for pituitary and midline lesions, yet proficiency has been shown to require conducting over 100 endoscopic transsphenoidal cases. Safe bone-dura exposure is rarely available for trainees, and current models either poorly reproduce this interface or are not easily accessible in large quantities. Here we present a low-cost, anatomically derived biomimetic simulator that recreates this interface to support and test bone-dura drilling skills.

Methods:
A deidentified CT scan was segmented with manual soft tissue reconstruction and the posterior septum and sphenoid were removed. An egg-holding recess was integrated so the eggshell was exposed within the sphenoid region, representing the bone-dura interface, and sealed to minimize dust leakage. Models were printed in Elastic 50A resin. Ten participants performed standardized high-speed drilling of a 2cm x 2cm area of the eggshell under endoscopic visualization. Metrics included construct validity (drilling time and breach events) and face and content validity assessed by Likert scales.

Results:
Construct validity was demonstrated through objective differences in performance. Face validity scores indicated high realism, especially regarding tactile feedback and the bone-dura interface. Content validity was similarly strong, with participants rating the model as useful for teaching skull base drilling. Faculty evaluators agreed the simulator appropriately targeted core skills required for safe skull base surgery.

Conclusion:
Anatomically accurate platforms for practicing skull base drilling are highly feasible and are an important area of research and development to enhance resident and fellow training.

Poster# ARS015

Analysis of the impact of acute rhinosinusitis on quality of life

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Background:
Disease-specific quality of life (QoL) burden is well studied in patients with chronic rhinosinusitis (CRS). However, no prior studies have looked at the impact of acute rhinosinusitis (ARS) on patients' QoL.

Objective:
To characterize and measure the impact of ARS on QoL in adult patients.

Methods:
Cross-sectional analysis of patients presenting to the otolaryngology clinic from August 2020 to July 2025 was performed. Patients presenting during an active episode of ARS were compared to CRS and control groups. Patients in the ARS and control groups had no history of CRS. Patients' characteristics and SNOT-22 scores were collected at their presentation.

Results:
177 patients with active ARS were compared to 466 CRS and 145 control patients. Patients with ARS were younger than both CRS and control patients (46.5 vs 50.8 vs 55.1 years respectively, $p<0.01$) but had similar sex distribution (female: 59.3% vs 51.5 % vs 55.9% respectively, $p=0.18$). After controlling for age, sex, allergic rhinitis, asthma, and smoking history, ARS patients had significantly higher SNOT-22 total and all subdomain scores compared with control patients ($p<0.01$ for all). Compared to CRS patients, ARS patients had similar rhinologic ($B= -1.03$, $p=0.09$) and arachnologic ($B=0.24$, $p=0.49$) domain scores but significantly lower ear/facial, sleep, and psychological subdomain scores ($p<0.05$ for all).

Conclusion:
QoL in patients with ARS is significantly affected in all domain scores, the most severe aspect being in the rhinologic symptoms. Severity of subjective disease burden appears to escalate in a stepwise pattern in accordance with chronicity of sinonasal disease.

Poster# ARS016

Anatomic variants in recurrent acute rhinosinusitis: A meta-analysis and retrospective cohort study

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Background:
Prior studies evaluating which sinonasal anatomic variants are associated with recurrent acute rhinosinusitis (RARS) have been inconsistent. This study aims to assess differences in prevalence of sinonasal anatomic variants between patients with RARS and asymptomatic controls.

Methods:
A search of PubMed, Scopus, CINAHL, and Cochrane databases was conducted from inception through August 2025. Cross-sectional studies examining computed tomography findings in RARS and asymptomatic controls were included. A review of preoperative imaging from all patients at this institution who underwent surgery for RARS and from a control group undergoing surgery for unrelated indications was also performed. Prevalences and odds ratios were derived using random effects meta-analyses.

Results:
From 4,736 screened articles, 4 studies were included, and preliminary institutional data included 33 RARS patients and 34 controls, with an anticipated total of 120 patients. In total, 796 patients were included. No significant differences in the prevalence of anatomic variants were found between RARS patients and asymptomatic controls. Anatomic variants assessed included: concha bullosa, infraorbital ethmoid (Haller) cells, septal deviation, frontal cells, sphenoethmoidal (Onodi) cells, accessory maxillary ostium, paradoxical middle turbinate, supra-agger cells, and supra-agger frontal cells. Pooled odds ratios ranged 0.53-2.22 with all $p > 0.05$.

Conclusion:
Prevalence of sinonasal anatomic variants did not differ significantly between RARS patients and asymptomatic controls, suggesting limited relevance in diagnosis and management of RARS. Further research using standardized radiologic definitions is needed to confirm these findings.

Poster# ARS017

Aspirin therapy and disease burden in older adults with AERD

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Background:
Aspirin-exacerbated respiratory disease (AERD) is an acquired inflammatory disorder characterized by asthma, eosinophilic chronic rhinosinusitis with nasal polyposis, and respiratory reactions to COX-1 inhibitors. Older adults may have distinct disease severity and treatment needs. This study evaluated disease burden and management patterns in AERD patients aged 70 years and older.

Methods:
A retrospective review was conducted of patients with a clinical diagnosis of AERD who were at least 70 years old as of September 1, 2025. Data collected included demographics, aspirin desensitization status, initial and current aspirin doses, biologic use, prednisone courses, and patient-reported outcomes (SNOT-22 and ACT).

Results:
Fifty-seven patients (mean age 75.3 ± 3.7 years) were included. Three patients (5.3 percent) had never undergone aspirin desensitization (AD), 15 (26.3 percent) completed AD but discontinued therapy due to adverse reactions, and 39 (68.4 percent) continued daily aspirin therapy after desensitization (ATAD). Among ATAD patients, the mean initial dose was 759 ± 345 mg, and the mean maintenance dose was 331 ± 132 mg. Five patients (12.8 percent) required a biologic and seven (17.9 percent) experienced asthma exacerbations requiring prednisone. Recent SNOT 22 (14.5 ± 16.8) and ACT (22.3 ± 3.5) scores indicated mild sinonasal symptoms and well controlled asthma.

Conclusion:
AERD patients aged 70 years and older who remain on ATAD are typically maintained on low dose aspirin yet demonstrate favorable sinonasal and asthma control. These findings suggest that lower dose ATAD may be sufficient in older adults, supporting the consideration of lower initial desensitization dosing strategies.

Poster# ARS018

Association between respirator mask utilization and post-WTC disaster olfactory dysfunction

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Introduction:
The World Trade Center (WTC) attack released pollutants that can deposit in the nasal cavity. In this study, we characterize the association between respirator mask utilization and olfactory dysfunction in WTC rescue and recovery workers.

Methods:
A retrospective cohort study was conducted using data linked to the medical records of patients seen within the Department of Otolaryngology of a large NYC Health System who listed the WTC Health Program (WTCHP) as the payer for the received medical service from 2010 to 2023. Responders who reported “rarely/never” or “some of the time” wearing their respirator mask during September 2001 were categorized in the low utilization group and “most of the time” or “always” as high utilization. The outcome variable was defined as subjective changes in smell or hyposmia/anosmia. Logistic regression models were used to determine the association between mask utilization and olfactory dysfunction while adjusting for sex, age, race, ethnicity, occupation, smoking status, and WTC arrival date (R version 4.3.1).

Results:
Of the 981 patients, 411 (41.9%) reported low respirator use. There was no significant difference in olfactory dysfunction among patients with high (7.5%) vs low (8.8%) use (p=0.49). Although not statistically significant, the odds of developing olfactory dysfunction in patients with low usage was nearly double that of patients who reported high usage (OR: 1.94, 95% CI: 0.97–3.90) in adjusted models.

Conclusion:
This study highlights the importance of respirator training and accessibility for disaster responders as mask use may be associated with olfactory dysfunction. Further research on this association using objective measures of olfaction are warranted.

Poster# ARS019

Association of sex and allergic rhinitis rates in Hispanic/Latino adults: Insight from the HCHS/SOL

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Background:
Allergic rhinitis (AR) is a common inflammatory disease with a large public health burden . The sex(male/female) difference in AR prevalence among Hispanics/Latinos, the fastest-growing minority group in the United States, must be further understood to guide interventions. This study investigates sex differences in AR prevalence and age-related trends using the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) data.

Methods:
Baseline (2008-2011) data from 16,116 HCHS/SOL participants aged 18-74 enrolled at 4 field centers (Bronx, Chicago, Miami, San Diego) was analyzed. AR presence was defined from self-reported responses to the question “Do you have hay fever?.” Cross-sectional bivariate and multivariable logistic regression analyses, accounting for the complex survey design and adjusted for demographic and socioeconomic factors were used to compute adjusted odds ratios (OR) and 95% confidence intervals (CI).

Results:
Among 16,116 subjects (40.1% male, 59.9 % female) , self-reported AR prevalence was 13.1% . Females had higher multivariable-adjusted odds of AR (OR: 1.47; 95% CI: 1.21–1.77). Age-stratified analyses showed increasing AR rates with age, with consistently higher burden in females. The greatest disparity appeared at ages 45–64, with prevalence of 12.1% in males and 18.9% in females. After 65, prevalence declined among females but increased in males.

Conclusions:
Hispanic/Latino females exhibited higher odds of AR than males. The greatest divergence was seen during perimenopausal years, with AR rates declining after 65 years, suggesting age-related hormone changes may affect inflammatory responses. These trends align with our findings from CDC’s NHANES and NIH’s All of Us datasets.

Poster# ARS020

Automated nasal septum segmentation using nnU-net for normal and pathological anatomy

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Objectives:
Manual nasal septum CT segmentation is labor-intensive and limits large-scale morphometric analysis. We developed and compared zero-shot versus pathology-inclusive deep learning models for automated septal segmentation, with emphasis on generalizability and rapid deployment for clinical use.

Methods:
Two 3D nnU-Net models were trained on sinus CTs (n=94). Model-1 (zero-shot) was trained on 49 normal septa. Model-2 (pathology-inclusive) was trained on 45 normal + 45 perforated scans. Validation included normal and perforated anatomy (Model-1 n=13; Model-2 n=16). Dice similarity coefficient (DSC) measured performance.

Results:
Zero-shot training achieved clinically acceptable accuracy on both normal and perforated anatomy (normal: DSC 0.921±0.005; perforated: 0.869±0.028), exceeding the 0.80 clinically acceptable threshold. Pathology-inclusive training improved performance for perforated septa (0.961±0.048 vs 0.869±0.028; +9.2-percent gain) while maintaining accuracy for normal anatomy (0.924±0.005 vs 0.921±0.005).

Conclusions:
A zero-shot nnU-Net model trained only on normal anatomy reliably generalizes to the perforated septum, enabling immediate clinical translation without labor-intensive labeling of pathology. Incorporating pathology further improves performance and represents a scalable refinement strategy. These results support deployment of automated, anatomy-aware septal segmentation for clinical morphometrics, surgical planning, and future point-of-care prosthesis fabrication.

Poster# ARS021

Biofilms in CRS: Systematic review

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Background:
Sinonasal biofilms have been linked to poorer recovery after endoscopic sinus surgery (ESS) in CRS patients. However, heterogeneity in biofilm detection methods and in outcome assessment have limited generalizability. We performed a systematic review and meta-analysis of biofilm–outcome associations at designated timepoints and mapped detection methods in CRS.

Methods:
In accordance with PRISMA 2020 guidelines, PubMed, Embase, Scopus, Web of Science, Cochrane databases, and ClinicalTrials.gov were searched through 08/2025 to identify CRS studies reporting defined sinonasal biofilm detection methods, outcomes, prevalence, or biomarkers. Random-effects models were used to summarize CRS–control biofilm prevalence and postoperative symptom and endoscopic outcomes.

Results:
33 studies included 845 CRS patients and 242 controls. Across 11 case–control cohorts, CRS tissue had higher odds of biofilms than controls (pooled OR 21.54, 95% CI 10.99–42.22). In the only long-term study, baseline biofilms increased odds of poor mucosal healing 8–14 months after ESS (OR 23.22, 95% CI 2.58–208.62). At 6 months, biofilm-positive patients (BF+) had worse symptoms (SMD 1.63, 95% CI 1.07-2.19) and higher Lund–Kennedy endoscopy scores (SMD 0.48, 95% CI 0.02-0.95) than biofilm-negative (BF-) patients. BF+ CRS was linked with Staphylococcus aureus–dominant communities, altered mucins (MUC5AC/MUC5B), and inflammatory signatures with reduced lactoferrin, increased lysozyme/SLPI, and TH1 cytokines (IFN-γ, TNF-α).

Conclusions:
Sinonasal biofilms are enriched in CRS. Regardless of detection methods, biofilms presence is associated with poorer symptom and mucosal healing outcomes, warranting further biofilm-targeted therapy trials.

Poster# ARS022
WITHDRAWN

Poster# ARS023
Cavernous sinus thrombosis: Presentation, management, and diagnostic delay
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Background:
Cavernous sinus thrombosis (CST) is life-threatening diagnosis. Early CST may be difficult to detect, presenting without overt orbital findings or classic radiographic clues.

Objective:
To present the largest single-institution series characterizing presentation, imaging patterns, and surgical timing in patients with CST, and identify factors leading to diagnostic delay.

Methods:
Retrospective cohort of 31 patients meeting radiologic criteria for CST. Diagnostic delay was defined as prior discharge or transfer with a diagnosis other than CST. Presenting symptoms, time to diagnosis, etiology, management, and extent of thrombosis were analyzed.

Results:
11 patients (35%) experienced diagnostic delay, commonly discharged from the ED with migraine, muscle strain, or uncomplicated sinusitis. Neck pain was associated with delay (55% vs 10%; p=0.010), and delayed patients were younger (38 vs 61 years; p<0.05). Overall, headache (62%), proptosis, and cranial neuropathies (CN) (64%) were common presenting signs. On imaging, sphenoid opacification (71%), bony erosion (32%), ophthalmic vein thrombosis (41%), and bilateral CST (31%) were common. Median time from symptom onset to presentation was 3.5 days with 93% receiving sinus surgery. 96% were anticoagulated with major bleeding in 12%, yet mortality was 0%. At imaging follow-up (mean 83 days), 72% had partial or complete CST resolution.

Conclusions:
Sphenoid sinusitis with headache, CN, orbital findings, or neck pain should prompt evaluation for CST. Bony erosion of the sphenoid sinus is not usually present even when sinusitis is the cause of CST. Awareness of subtle presentations, especially in younger patients, and aggressive early intervention can prevent irreversible injury.

Poster# ARS024

CF carrier status increases medical burden in chronic rhinosinusitis: A propensity-matched study

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Introduction:
Cystic fibrosis (CF) is a recognized cause of severe chronic rhinosinusitis (CRS), but the impact of CF carrier status is less well-defined. Although carriers are typically considered asymptomatic, many report chronic sinonasal symptoms. We aimed to determine if CF carriers with CRS experience a more intensive treatment course than confirmed non-carriers.

Methods:
Using the TriNetX research network, we identified CRS patients confirmed as CF carriers via genetic testing and matched them 1:1 to CRS patients testing negative for CF. Propensity matching included demographics and clinically relevant comorbidities (e.g., asthma, smoking). We compared rates of endoscopic sinus surgery (ESS), oral steroids, antibiotics (amoxicillin–clavulanate), and intranasal therapies (2009-2025).

Results:
3,896 patients were included (1,948 per group). Carrier status was not associated with higher ESS rates (5.2% vs 6.1%; p=0.21). However, carriers had a significantly greater medical burden, including higher use of oral prednisone (37.0% vs 27.3%; p<0.0001) and amoxicillin–clavulanate (37.2% vs 33.0%; p=0.007). Antibiotic-treated carriers received more courses per patient (2.78 vs 2.33; p=0.008). Overall, topical therapy use was higher in carriers (62.9% vs 53.1%; p<0.0001), driven by increased use of intranasal steroids and decongestants (tetrahydrozoline, oxymetazoline, and phenylephrine). Rates of intranasal antihistamine use were similar.

Conclusion:
Although ESS rates were similar, CF carriers required substantially more medical therapy. These findings suggest carriers may exhibit a more symptom-prone or inflammation-leaning CRS phenotype, reinforcing the need for careful follow-up and early optimization of medical management.

Poster# ARS 025

WITHDRAWN

Poster# ARS026

Characterizing the scholarly impact and geographic distribution of rhinology fellowship graduates

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Background:
Assessing academic productivity and geographic patterns among rhinology fellowship graduates provides insight into evolving subspecialty trends. This study examines scholarly output and geographic distribution of graduates to better define the current landscape of rhinology practice.

Methods:
Rhinology fellowship graduates from 2012-2024 were identified through SFMatch, the ARS website, and alumni lists. Demographics, education, practice type, location, and publication count at graduation (T) and five years post-graduation (T+5) were recorded. Linear regression assessed publication trends; odds ratios examined associations between training variables and academic practice.

Results:
A total of 359 graduates were included; 50.4% entered academic practice. At graduation, academic rhinologists had more publications than non-academic graduates (median 9 vs 6; $p<0.001$), though this gap was not significant in the 2020-2024 cohort (13 vs 12.5, $p=0.46$). Publication volume increased over time for all graduates ($\beta=1.0$, $p=0.004$). By T+5, the productivity gap had widened substantially (24 vs 8.5, $p<0.001$). Higher publication count at T was associated with pursuing academic practice (OR 1.1; 95% CI 1.0-1.2; $p=0.04$). Fellowship training concentrated in the South (35%) and Northeast (29%), while practice clustered in the South (28%), West (22%), and Northeast (21%). State-level rhinologist density varied, highest in Delaware and Nebraska (2.0 per million residents), and lowest in Indiana and Iowa (0.3).

Conclusion:
Rhinology fellowship graduates show increasing scholarly output over time with early productivity associated with academic careers. Geographic patterns reveal regional clustering with workforce density variation.

Poster# ARS027

Chronic rhinosinusitis outcomes related to pharmacy access

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Introduction:
Pharmacy access has been linked to poor health outcomes; however, its relationship with chronic rhinosinusitis (CRS) remains unclear. Here, we sought to elucidate the relationship between pharmacy access and CRS treatment outcomes.

Methods:
Participants with CRS were prospectively enrolled and either continued medical therapy or underwent endoscopic sinus surgery. 22-item SinoNasal Outcome Test (SNOT-22), Medical Outcomes Study Questionnaire Short-Form 6-D (SF-6D), and Lund Kennedy (LK) nasal endoscopy scores were recorded at baseline and at 6-month follow-up post-treatment. Pharmacy access (i.e., good, low, desert) was determined for each subject using ArcGIS census tract data; pharmacy count, as well as distance and drive time to the nearest pharmacy was determined using GeoMD. Spearman's correlation coefficients were calculated with 95% confidence interval and effect size.

Results:
Among 521 participants (mean age 52.2 ± 14.8 years; 48.8% male), 24 (4.6%) lived in a pharmacy desert and 63 (12.1%) in a low-access area. Rates of achieving >1 MCID in SNOT-22 or SF-6D scores did not differ based on pharmacy access. Greater pharmacy distance and drive time showed weak, non-significant association with improvement in SNOT-22 ($r=-0.01$ for both) and SF-6D ($r=0.028$ and $r=0.026$, respectively) scores but were significantly correlated with less improvement in LK scores ($r=-0.15$, $p=0.035$ and $r=-0.15$, $p=0.032$ respectively).

Conclusion:
Although pharmacy access was not associated with improvement in SNOT-22 or SF-6D scores, pharmacy distance and drive time did correlate with significantly less improvement in LK scores. The impact of neighborhood level resources on CRS treatment outcomes requires additional investigation.

Poster# ARS028

Chronic rhinosinusitis referral triage via data-driven centralized scheduling system

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Background:
Efficient triage of specialty referrals is increasingly important as referral volumes rise. The University of Kansas, the state's only academic otolaryngology (ENT) program, receives numerous subspecialty referrals. A structured triage decision tree previously directed patients to general ENTs, specialists, or advanced practice providers, but such tools are static and cannot capture real-time patterns. To address this, a centralized scheduling system was implemented in September 2024, integrating interactive, HIPAA-compliant interfaces that record scheduler–patient interactions and transform triage into a dynamic, data-driven workflow.

Methods:
Schedulers used the interface as a branching call script, with prompts appearing based on prior responses. Experimental questions were added to evaluate predictors of surgical candidacy, particularly among patients with nasal complaints. Outcomes were analyzed using tree-based algorithms to refine the pathway once significance thresholds were met.

Results:
Over 12 months, 6,524 new patients were scheduled. The most common diagnosis was sinusitis (9.7%, n=679). Among sinusitis patients, median time from scheduling to initial visit was 39 days (IQR 27). Recursive partitioning identified antibiotic use in the prior year as the strongest predictor of surgical candidacy: patients reporting ≥3 antibiotic courses were more likely to undergo surgery than those reporting ≤2 (32.1% vs 15.8%, p=0.04).

Conclusions:
Centralized, data-driven scheduling systems enable real-time evaluation of referral patterns and identification of surgical predictors. Structured data capture at scheduling supports continuous refinement of triage pathways, improving efficiency and access to care.

Poster# ARS029

Chronic rhinosinusitis risk in OSA: CPAP compared to HGNS

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Introduction:
Chronic rhinosinusitis (CRS) is highly prevalent in patients with obstructive sleep apnea (OSA). Continuous positive airway pressure (CPAP) may worsen sinonasal inflammation via chronic intranasal positive pressure, whereas hypoglossal nerve stimulation (HGNS) treats OSA without directly altering nasal airflow. This is the first study to assess incident CRS in OSA patients treated with CPAP versus HGNS.

Methods:
TriNetX, a global research database, was utilized to identify patients with OSA who underwent HGNS or CPAP. Patients with prior CRS were excluded. Risk of developing a new CRS diagnosis and associated outcomes was compared within one month to five years following the OSA treatment.

Results:
After 1:1 propensity score matching for demographics, comorbidities, and healthcare utilization, 6,400 OSA patients receiving CPAP were matched to 6,400 HGNS patients. CRS occurred in 2.7% of CPAP vs 1.8% of HGNS patients (RR: 1.56, 95% CI 1.24–1.98, $p < 0.001$). Acute sinusitis affected 4.5% vs 3.1% (RR: 1.44, 95% CI 1.21–1.72, $p < 0.001$), and allergic rhinitis occurred in 9.8% vs 5.8% (RR: 1.70, 95% CI 1.50–1.92, $p < 0.001$). HGNS patients had fewer antibiotic prescriptions (12.4 vs 4.3), and were less likely to receive any antibiotics (RR 1.68, 95% CI 1.62–1.74, $p < 0.001$). These findings suggest HGNS may reduce sinonasal inflammatory outcomes and infectious complications relative to CPAP in OSA patients.

Conclusions:
This is the first study to compare CRS risk in OSA patients treated with CPAP versus HGNS in a large real-world population. HGNS was associated with lower rates of CRS and related sinonasal outcomes, highlighting a potential clinical advantage that warrants further prospective investigation.

Poster# ARS030

Clinical value of histopathological examination of sinus contents following endoscopic sinus surgery

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Significance:
Although multiple studies report a low prevalence of clinically significant pathology from routine sinus surgery, histopathologic examination remains standard. We examined postoperative diagnoses of chronic sinusitis, nasal polyposis, masses with and without malignant suspicion, fungal sinusitis, and others to further characterize indications for biopsy. Histopathological reporting of nasal polyps guides biologic therapy, so we aimed to characterize the pathology language used to describe nasal polyps.

Methods:
This was an institutional review board approved retrospective chart review. Billing records of 3 physicians within the Rhinology division of the Otolaryngology department at University Hospitals Cleveland Medical Center identified 1,034 patients who underwent endoscopic sinus surgery between January 2021 and May 2025 and met inclusion and exclusion criteria. Preoperative notes and postoperative pathology reports were reviewed in the medical record.

Results:
Clinically significant diagnoses were observed in 0.35% of cases with chronic sinusitis without polyposis and 3.6% of cases with polyposis. Histopathologic reporting of polyposis was highly variable, and eosinophils were described only qualitatively. Inverted papilloma was noted in one case of a suspected unilateral mucocele. Among 17 malignant sinonasal masses, 16 had malignant suspicion.

Conclusion:
Biopsies of bilateral chronic sinusitis without malignant suspicion offers little clinical benefit. Nasal polyps should be biopsied and reported with standardized methods, including degree of inflammation, inflammatory predominance, and high-power field quantification of eosinophils to guide biologic therapy. All sinonasal masses warrant biopsy.

Poster# ARS031

Coal worker's pneumoconiosis and chronic rhinosinusitis

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Introduction:
Long-term exposure to fine particulate matter air pollutants like PM2.5 can cause sinonasal mucosal dysfunction and increased inflammatory cytokines and is correlated with chronic rhinosinusitis (CRS) diagnosis. The coal industry possesses a unique occupational exposure to fine particulate matter, with the eponymous coal worker's pneumoconiosis (CWP) being a long-term pulmonary sequela. We seek to investigate whether CWP is associated with an increased risk of developing CRS and other sinonasal diseases.

Methods:
TriNetX was queried for adults who had an outpatient clinic visit with or without a diagnosis of CWP and no prior CRS. CWP and non-CWP cohorts were propensity-score matched on age, sex, race, smoking, and history of vasomotor/allergic rhinitis, asthma, and COPD. Differences in cohort risk of CRS, acute rhinosinusitis (ARS), nasal polyps, cysts/mucoceles, turbinate hypertrophy, postnasal drip, and sinonasal cancer as well as frequency of ARS diagnoses were assessed using t-tests. Risk percentages and risk ratios (RR) are reported.

Results:
Matched cohorts had 4,296 patients each (total n=8,692). Compared to the general population cohort, CWP had 2.8 times greater risk of developing CRS (3.11% vs 1.09%, $p<.0001$). CWP had lower risk of cysts/mucoceles (0.23% vs 0.72%, RR: 0.32, $p=.0010$). Sinonasal cancer analysis was inconclusive due to negligible prevalence. All other outcomes had comparable risk ($p>.05$).

Conclusion:
Those with CWP are more likely to develop CRS than the general population. Measures that limit coal-related particle exposure may help reduce CRS burden among those in coal-related occupations.

Poster# ARS032

Combination sinus surgery and septorhinoplasty

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Objective:
To evaluate postoperative outcomes and complications of combination functional endoscopic sinus surgery (FESS) and septorhinoplasty (SRP).

Methods:
This is a multicenter retrospective study utilizing data from 106 healthcare organizations in the United States from the TriNetX database from January 1, 2010 to July 31, 2025. Patients were aged 18 years or older and underwent combination FESS/SRP, FESS alone, or SRP alone. Combination surgery was compared to each surgery alone. Postoperative outcomes and complications evaluated were epistaxis, mucocele formation, postoperative pain, orbital injury, abscess/infection, revision rhinoplasty, and septal perforation needing repair, among others.

Results:
Compared with FESS alone, combination FESS/SRP showed higher rates of postoperative pain and nasal mucocele (RR: 1.25[1.02–1.52]; 1.33[1.15–1.53]) but no increased risk of acute or chronic sinusitis (RR: 0.97[0.89–1.06]; 0.99[0.97–1.03]). Combination FESS/SRP did not have a higher rate of orbital injury (0.84[0.74-0.95]) compared to FESS alone. Compared with SRP alone, combination surgery was associated with more persistent septal deviation (RR: 1.18[1.10–1.26]) and higher rates of epistaxis and control of epistaxis procedures (RR: 1.85[1.49–2.29]; 2.00[1.28–3.12]). Septal perforation repair was not significantly higher with combination surgery (RR: 1.11[0.60–2.05]), though nasal infection/abscess was more frequent (RR: 1.17[1.13–1.21]). Revision rhinoplasty was not higher in the combination surgery group (RR: 0.42[0.28-0.64]).

Conclusion:
Combination surgery did not show significant major complications, though rates of epistaxis, nasal congestion, and infection were higher.

Poster# ARS033

Combined FESS and sequestrectomy for stage 3 maxillary MRONJ

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Introduction:
Management of Stage 3 maxillary MRONJ is often complicated by coexisting sinusitis. Oral sequestrectomy alone has historically shown high failure rates, likely due to unaddressed sinusitis. This study evaluates the efficacy of combined sequestrectomy and functional endoscopic sinus surgery (FESS) to promote faster mucosal healing and sinonasal symptom resolution.

Methods:
A retrospective cohort study was conducted on 28 patients treated for Stage 3 maxillary MRONJ. All patients underwent sequestrectomy with FESS. Radiographic phenotypes were analyzed to assess recovery impact.

Results:
There were 28 patients with stage 3 MRONJ. The mean age was 69.2 years, and most patients had metastatic malignancies (n=17,61%) including breast cancer, prostate cancer, and multiple myeloma. Among patients with available medication history, 75% were treated with high-potency antiresorptives, specifically Zoledronic Acid (n=6,37.5%) or Denosumab (n=6,37.5%). Surgical management included maxillary antrostomy (n=15,54%) and total ethmoidectomy (n=15,54%). Complete outcome data was available for 12 patients. The combined approach achieved a mucosal healing rate of 75.0% (9/12). The median time to healing was 2.6 months. Additionally, 80% (8/10) patients with reported data demonstrated complete resolution of chronic sinusitis symptoms. Notably, patients with sclerotic lesions demonstrated a robust 70% healing rate (7/10).

Conclusion:
The addition of FESS to sequestrectomy in this setting effectively manages associated sinusitis and may contribute to improved surgical success and healing. The approach appears particularly effective for metastatic cancer patients on high-potency antiresorptives, regardless of radiographic phenotype.

Poster# ARS034

Comparative outcomes of upfront biologic therapy in CRSwNP

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Introduction:
This study aimed to compare ESS rates and healthcare utilization among CRSwNP patients started on different upfront biologic therapies.

Methods:
We conducted a retrospective cohort study using the TriNetX platform to compare outcomes among patients who initiated upfront dupilumab versus mepolizumab and dupilumab versus omalizumab. The primary outcome was the rate of ESS at 5-year follow-up. Secondary outcomes included healthcare utilization from 1 month to 5 years, specifically CRSwNP-related clinic visits, diagnostic nasal endoscopy, antibiotic prescriptions, and oral corticosteroid prescriptions. Propensity score matching (1:1) was performed to balance cohorts.

Results:
A total of 356 patients were included in each cohort when comparing outcomes between dupilumab and omalizumab. At 5-year follow-up, patients who received upfront dupilumab therapy had 0.56-times lower odds of undergoing ESS (95% CI: 0.34–0.90). Among the 531 patients treated with either dupilumab or mepolizumab, there was no statistically significant difference in ESS rates. At 5-year follow-up, the only meaningful difference in healthcare utilization was the rate of antibiotic and oral corticosteroid prescriptions, with the primary dupilumab group receiving fewer antibiotics ($p < 0.0001$) and oral corticosteroids ($p < 0.0001$) compared to the mepolizumab and omalizumab cohorts.

Conclusion:
Dupilumab used as upfront therapy for CRSwNP was associated with lower rates of ESS compared with mepolizumab and omalizumab. Additionally, the dupilumab cohort received fewer antibiotic and oral corticosteroid prescriptions. Overall, these findings suggest that dupilumab may offer more effective disease control than other FDA-approved biologics for CRSwNP.

Poster# ARS035

Comparing anticholinergic burden and dementia risk in first- and second-generation antihistamines

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Background:
Antihistamines are commonly used, but their cognitive safety varies. First-generation antihistamines (FGAs) have strong anticholinergic activity and readily cross the blood–brain barrier, linking them to long-term cognitive harm. Second-generation antihistamines (SGAs) show minimal central effects and low anticholinergic burden. A concise synthesis is needed for aging adults at risk of cognitive decline.

Methods:
we conducted a narrative review (2009–2024) and examined epidemiologic, pharmacologic, mechanistic, and pharmacoepidemiologic evidence on FGA and SGA exposure, anticholinergic load, cognition, and dementia, including national cohorts, nested case-control studies, longitudinal analyses, mechanistic work, and clinical trials.

Results:
Population studies consistently identify FGAs as major contributors to anticholinergic burden, with dose-dependent associations between cumulative exposure and incident dementia (hazard ratios ~1.1–1.5). Mechanistic data support muscarinic blockade and disrupted cholinergic signaling as pathways to memory impairment. Despite these risks, FGAs remain commonly used in older adults.
SGAs have low lipophilicity and are transported out of the brain by P-glycoprotein, resulting in minimal central penetration. Clinical trials show negligible effects on attention, memory, or psychomotor function, and epidemiologic data do not link SGAs to dementia, supporting their role in reducing anticholinergic burden.

Conclusion:
FGAs are consistently associated with increased dementia risk, while SGAs appear cognitively safe alternatives. Favoring SGAs may lower anticholinergic load and support healthy aging. Further interventional research is needed to guide optimal management.

Poster# ARS036

Comprehensive management of the nasal valve region

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Objective:
Nasal valve dysfunction stems from multiple anatomic contributors across the internal and external valve, yet minimally invasive options often target only one element. Other contributors include excess fibrofatty tissue, inferior turbinate head hypertrophy, and enlargement of septal or vestibular swell bodies. Septal spurs and lower lateral cartilage abnormalities can further narrow the aperture. Because these frequently coexist, single-site intervention may be insufficient. We describe a comprehensive, structure-directed laser approach and report early outcomes.

Methods:
A retrospective review of 105 patients treated in-office over 18 months; 64 underwent bilateral procedures. Evaluation included targeted palpation and nasal endoscopy. Local anesthesia consisted of sublabial, turbinate, swell body, and septal spur injections. A 940-nm diode laser was used: non-contact blanching for upper lateral cartilage, interstitial therapy for turbinates and swell bodies, and contact mode for septal spurs. All patients had inferior turbinate treatment; 60 had swell bodies treated, 28 had septal spur reduction, and 14 had upper lateral cartilage or fibrofatty ablation. Outcomes were assessed with NOSE scores at 90 days.

Results:
No intra- or postoperative complications occurred. Significant improvement was seen, with mean NOSE score reductions of 41 points for bilateral procedures and 45 for unilateral.

Conclusion:
Comprehensive laser therapy allows individualized treatment of multiple contributors to nasal valve obstruction. This office-based technique was safe, well tolerated, and produced early quality-of-life improvement, supporting its role as a versatile, minimally invasive option for internal and external nasal valve disease.

Poster# ARS037

Could ENS be prevented with virtual surgery planning?

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Empty Nose Syndrome (ENS), a rare and debilitating disease, is often controversially linked with aggressive turbinate surgery. We retrospectively recruited 9 patients who had undergone sinus surgery and developed ENS post-operatively and performed a conservative inferior turbinate reduction using our published virtual surgery planning system based on their pre-operative CT scan. 3D computational fluid dynamics (CFD) models were then created based on their pre-surgery, post-surgery, and conservative virtual surgery CT scans and compared. Airway cross-sectional area (CSA) significantly increased after actual (AS)- and virtual-surgery (VS) within the inferior turbinate regions (pre: 5.62E-5±2.27E-5 m2, post: 7.63E-5±3.54E-5, virtual: 8.60E-5±2.08E-5, $p<0.05$), with no significant difference between them, indicating similar degree of surgery. This was unexpected but could reflect our conservative VS removing a significant amount of turbinate tissue. For the middle turbinate (MT) region, only post-AS CSA is significantly increased (pre: 5.45E-5±2.69E-5, post: 7.19E-5±1.53E-5, virtual: 5.72E-5±2.72E-5, $p<0.01$), but not VS. Surprisingly, the nasal airflow patterns are completely different between AS vs. VS. The inferior airflow % significantly increased post-VS (expected) but paradoxically decreased post-AS (pre: 46.07±18.2%, post: 38.66±15.9%, virtual: 58.88±15.2%, $p<0.05$). Middle airflow % showed the opposite: significantly decreasing post-VS, but paradoxically increased post-AS (pre: 47.17±14.3%, post: 55.79±14.7%, virtual: 37.35±14.7%, $p<0.05$). Imbalanced surgical approaches, even if conservative, may create unexpected airflow distortion. Virtual surgery planning could be an effective tool to prevent ENS symptoms in the future.

Poster# ARS038

CRS incidence in patients with OSA

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Background:
Chronic rhinosinusitis (CRS) has been reported to contribute to upper airway resistance. Patients presenting with obstructive sleep apnea (OSA) are not routinely screened for sinusitis. It has been documented that occult sinusitis occurs with regularity as an incidental finding in CTs (Hudgins et al). Therefore this study was undertaken to evaluate the incidence of occult sinusitis that presented with OSA.

Methods:
A retrospective review was performed using Sleep and Sinus Centers of Georgia's database. Patients with CRS and OSA were identified with 6,712 patients presenting with OSA between 2015 and 2025. A subset of these patients was identified with CT identified sinusitis. Anatomic subtypes were identified. AHI from polysomnography data was compared across sinus groups. Correlations were calculated between apnea severity and the presence of maxillary, frontal, ethmoidal, or sphenoidal disease.

Results:
Among 6,712 patients with OSA, 1,762 (26.3%) also had CRS. Maxillary disease was the most common subtype (21% of the cohort; 50% of patients with CRS), followed by frontal (10%; 25%), ethmoidal (6%; 15%), and sphenoidal involvement (6%; 13%). Representative samples from maxillary sinusitis demonstrated median values of AHI=24, Lund Makay (LM)=8, SpO2 min=81, while pansinusitis values were 54, 11, and 75, respectively.

Conclusion:
CRS affected 26.3% of adults with OSA, with maxillary disease, the most common subtype. These results support further study of CRS as a possible modifier of OSA severity and suggest that evaluation for CRS may be reasonable in adults with OSA.

Poster# ARS039

Cumulative steroid exposure and complication risk in chronic rhinosinusitis with nasal polyps

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Objectives:
To identify the risk of multiple steroid courses with steroid-related complications (SRC) in patients with chronic rhinosinusitis with nasal polyposis (CRSwNP).

Methods:
TriNetX, a database of 106 de-identified healthcare organizations, was queried for adults with CRSwNP with no pre-existing autoimmune diseases, pulmonary diseases, or diabetes mellitus. Steroid exposure was limited to within 2 years of diagnosis. Patients were grouped by number of courses and propensity score-matched for demographics and clinical covariates. Incidence of SRC from 1 month to 2 years post-prescription included: skeletal (osteoporosis and pathological fracture), gastrointestinal (ulcer), psychiatric, endocrine, infection (UTI and candidiasis).

Results:
After matching, cohorts 1 and 2 included 1,642 patients in each cohort. 1 course was associated with lower SRC (RR = 0.81, 95% CI [0.69, 0.93]), lower rates of metabolic disorders (RR = 0.57 [0.33, 0.97]), lower infection rates (RR = 0.42 [0.28, 0.63]) compared to 2 courses. In the matched 2 vs. 3 course analysis, 598 patients were included in each cohort. Similar SRC rates were seen in the 2 vs. 3 course analysis (RR = 1.01 [0.81, 1.26]). In the matched 3 vs. 4-6 course analysis, 517 patients were included in each cohort. SRC risk was lower in patients receiving 3 courses compared to 4-6 courses (RR = 0.79 [0.63, 0.99]). Patients receiving 3 courses had lower infection rates (RR = 0.42 [0.25, 0.71]) compared to 4-6 courses. Median follow-up was 730 days for all cohorts.

Conclusion:
In patients with CRSwNP, cumulative systemic steroid exposure is associated with increased risk of SRCs. Two or more courses within 2 years may represent a threshold for elevated risk of SRC.

Poster# ARS040

Deep learning morphometry of the nasal septum

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Objectives:
To develop morphometric analysis of the nasal septum and establish normative anatomical reference ranges across a large clinical population using a deep learning model.

Methods:
An nnU-Net model trained on 125 manually segmented sinus CTs (Dice 0.983 ± 0.005; holdout n = 24) automatically segmented 1,548 additional CT scans, yielding a cohort of 1,673 adults. Extracted morphometrics included septal volume, surface area, sagittal cross-sectional area (CSA), and septal height, width, and length. Sex differences and associations with comorbidity and ethnicity were evaluated.

Results:
Mean septal volume was 13,789 ± 3,068 mm^3, surface area was 8,052 ± 1,191 mm^2, and maximum sagittal CSA was 2,450 ± 515 mm^2. Marked sexual dimorphism was present: males demonstrated larger volume (16,627 ± 2,518 vs 12,605 ± 2,467 mm^3, $p<0.001$), surface area (8,713 ± 889 vs 7,437 ± 900 mm^2, $p<0.001$), and maximum CSA (2,653 ± 499 vs 2,235 ± 469 mm^2, $p<0.001$). Septal dimensions (width, height, length) showed similar patterns. No significant differences were observed across ethnic groups, and morphometrics demonstrated minimal association with the charlston comorbidity index.

Conclusions:
Deep learning enabled large-scale, objective quantification of septal anatomy and established normative 3-D morphometric reference ranges across the largest cohort to date. While septal size differed substantially by sex, global geometric characteristics were largely conserved across demographic groups. Automated morphometrics offer reproducible anatomical benchmarks for septal evaluation and provide a foundation for future studies linking anatomy with physiology, computational modeling, and surgical planning.

Poster# ARS041

Delayed sinonasal complications after facial feminization surgery: A retrospective case series

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Introduction:
Frontal sinus setback is widely used in facial feminization surgery (FFS), yet its long-term sinonasal outcomes remain poorly characterized. Prior work largely relies on isolated case reports, leaving the real-world incidence, timing, and severity of postoperative sinus disease unclear.

Methods:
We conducted a retrospective case series of patients undergoing FFS with frontal sinus setback at a single tertiary care center between November 2020 and October 2024. The primary outcome was defined as new-onset or worsening of sinonasal symptoms prompting referral to rhinology. Clinical factors, time to symptom onset, and candidacy for frontal sinus surgery were also assessed.

Results:
A total of 45 patients were included. Three cases (6.7%) developed new or worsening sinonasal symptoms after setback, presenting from postoperative day 14 to more than 2 years later. The average time from FFS to rhinology consultation was 507 days (SD=167). Compared to asymptomatic patients, affected individuals were older on average (41.7 vs 34.6 years; $p<0.001$) and trended towards higher BMI values (30.1 vs 27.1; $p=0.112$), though these differences reflect a very small symptomatic subgroup. All patients with medically refractory frontal sinusitis were candidates for endonasal surgical management, and one elected to proceed.

Conclusion:
Frontal sinus setback was associated with an increased risk for delayed sinonasal morbidity that may require surgical intervention. These findings support increasing awareness across specialties, targeted preoperative risk assessment, and structural postoperative monitoring in patients undergoing FFS.

Poster# ARS042
WITHDRAWN

Poster# ARS043
Development of a new sinonasal wound healing scale
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Background:
Sinus and skull base surgery frequently results in areas of demucosalized bone and cartilage in the sinonasal cavity. However, there is no system to describe the mucosa as it heals. The goal of this study is to create and validate a sinonasal wound healing scale.

Methods:
Using a modified Delphi method, ten rhinologists and one PhD otolaryngology research scientist developed a wound healing scale after 3 rounds modified Delphi with consensus set at 80%. The agreed-on scale consisted of: Stage 0: Fully Remucosalized, Stage 1: Mostly Remucosalized, Stage 2: Extensive healing (granulation) tissue, minimum remucosalization, Stage 3: Minimum healing (granulation) tissue. 59 videos of nasoseptal flap harvest sites were reviewed by 14 blinded reviewers to determine the inter-rater reliability. The reviewers were asked to repeat the evaluation after at least 1 month to determine intra-rater reliability.

Results:
The inter-rater reliability was good for individual raters (ICC(A,1) = 0.77) and excellent for mean ratings (ICC(A,14) = 0.96). Intra-rater ICCs ranged from 0.65-0.94 (mean ≈ 0.83), indicating moderate intra-rater reliability for one rater and good to excellent repeatability for the remainder.

Conclusions:
This new Sinonasal Wound Healing Scale is an easy-to-use scale that can be used to describe demucosalized areas in the sinuses as it heals. These results indicate that the Sinonasal Wound Healing Scale is applied consistently both between raters and within raters over time. This scale may be used in the future to critically evaluate the effects of medications, techniques, or topical dressings on the healing of sinonasal wounds.

Poster# ARS044
WITHDRAWN

Poster# ARS045
Dietary interventions in sinusitis
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Background:
Sinusitis includes inflammatory conditions of the paranasal sinuses commonly treated with pharmacologic therapy, with surgery reserved for refractory cases. Despite its prevalence, research on non-pharmacologic management remains limited. Emerging evidence suggests dietary factors may influence systemic inflammation and contribute to sinusitis pathophysiology.

Objective:
This systematic review aimed to synthesize current evidence on the association between diet and sinusitis.

Methods:
A systematic review was conducted following PRISMA guidelines. PubMed and Scopus were searched for studies examining diet and sinusitis. Exclusion criteria included irrelevant titles or abstracts, non-English publications, supplement-focused studies, and non-human subjects. Eligible studies assessed chronic rhinosinusitis, sinusitis, or rhinosinusitis in relation to diet. Study quality was evaluated using ROBINS-I and JBI checklists.

Results:
Of 891 articles, 6 met inclusion criteria. Mediterranean, low-sugar, elimination, and salicylate-restricted diets were associated with improved sinonasal outcomes. A Mediterranean diet reduced infection rates in children, while lower sugar intake decreased TNF-α and increased IL-10. High-salicylate foods worsened symptoms in CRSwNP and AFRS, and elimination diets improved symptom and endoscopic scores in refractory CRS. Population studies linked high fat, energy intake, and AFH meals with greater CRS prevalence, while cucumber consumption was inversely associated with risk.

Conclusions:
Dietary modification may lower systemic inflammation and serve as an adjunctive approach in sinusitis management. Further studies are needed to define evidence-based dietary recommendations.

Poster# ARS046

Dupilumab and ESS in CRSwNP management

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Introduction:
The objective of this study was to evaluate the incidence of ESS and patterns of healthcare utilization among CRSwNP patients receiving biologics either as upfront therapy or following ESS.

Methods:
We conducted a retrospective cohort study using the TriNetX platform to compare outcomes among patients who underwent primary ESS versus upfront dupilumab therapy, as well as patients who received postoperative dupilumab versus those who did not. The primary outcome was the rate of ESS at 5-year follow-up. Secondary outcomes included healthcare utilization from 1 month to 5 years, specifically CRSwNP-related clinic visits, diagnostic nasal endoscopy, antibiotic prescriptions, and oral corticosteroid prescriptions. Propensity score matching was performed to balance cohorts.

Results:
A total of 2,671 patients were included in the primary surgery and upfront biologic cohorts. At 5-year follow-up, patients who received upfront biologic therapy had 1.54-times higher odds of undergoing ESS (95% CI: 1.3–1.9). At 5-year follow-up, the only meaningful difference in healthcare utilization was the rate of nasal endoscopies, with the primary biologic group undergoing fewer scopes ($p < 0.0001$). Although biologic prescription after ESS showed lower revision rates, the difference was not significant at 5 years (OR 0.9, 95% CI 0.7–1.8). Healthcare utilization was similar between cohorts.

Conclusion:
Upfront biologic therapy was associated with higher long-term rates of ESS compared with primary surgery, while postoperative biologics did not significantly reduce revision rates. These results support ESS as a durable initial intervention and highlight the need to continue to evaluate the optimal timing of biologic therapy in CRSwNP.

Poster# ARS047

Early changes in biomarkers and S. Aureus with Dupi for CRSwNP

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Dupilumab's efficacy as a modulator of Type 2 inflammation has revolutionized the treatment of chronic rhinosinusitis with nasal polyps (CRSwNP). E-diaries from industry-sponsored clinical trials suggest symptom improvement within days of treatment. To date, no studies have investigated changes in Type 2 inflammatory cytokines and microbiome shifts in the early phases of treatment. This study hypothesizes a rapid and sustained shift of local intranasal cytokines and reduction in live Staphylococus aureus burden in as early as 24-48 hours following dupilumab initiation.

This is a prospective pilot study of 5 biologic-naïve subjects with CRSwNP refractory to treatment. Subjects were enrolled for 6 visits with a pre-intervention baseline 3-5 weeks prior to initial treatment. Sinonasal samples were measured at 24 hours, 48 hours, 2 weeks (prior to second injection), and 24 hours after the second injection with nasal swabs and sponges placed in the middle meatus bilaterally. Mucus Eotaxin-3, IL-4, IL-5, IL-8, IL-13, IL-18, IL-33, and TSLP concentration levels were measured.

Mean baseline Sino-Nasal Outcome Test (SNOT)-22 and University of Pennsylvania Smell Identification Test (UPSIT) scores were 47 (SD 24.2) and 16 (SD 15) with changes of 16.8 ($p=0.003$) and 0.8 ($p=0.107$), respectively. Eotaxin-3, TSLP, and IL-18 demonstrated the greatest changes in mean concentration pre- and post-treatment but were not statistically significant. The mucus of 3 subjects had measurable live S. aureus with 2 demonstrating a decrease and 1 demonstrating an increase in colony-forming units post-treatment. Some patients showed rapid change in cytokines and S. Aureus. Further study is needed to use this data to better understand biologic response.

Poster# ARS048

Effect of chronic rhinosinusitis on endoscopic DCR outcomes: Single-center cohort

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Background:
Chronic Rhinosinusitis (CRS) is a condition affecting 5-12% of the population. For patients with CRS and nasolacrimal duct obstruction, it is unclear if baseline inflammatory mucosal disease contributes to endoscopic dacryocystorhinostomy (DCR) failures. The impact of pre-existing CRS on DCR outcomes is herein evaluated.

Methods:
A retrospective review of 515 consecutive endoscopic DCR candidates at a single institution from July 2018 to July 2023 was conducted. We examined the associations between preoperative CRS diagnosis and CT markers of sinonasal disease with DCR failure. Propensity-score matched analysis of endoscopic DCR patients with and without CRS was also performed within the TriNetX database.

Results:
CRS diagnosis was not associated with DCR failure (OR 1.046 95% CI 0.410, 2.668). Radiographic markers including mucosal thickening/soft tissue opacification (OR 1.083 95% CI 0.363, 3.231), polypoid change (OR 0.529 95% CI 0.117, 2.394), prior sinus surgery (OR 1.136 95% CI 0.259, 4.980), and sinus disease (OR 1.975 95% CI 0.456, 8.553) were not associated with DCR failure (Fisher's exact test $p>0.05$). In TriNetX, comparing cohorts of 771 patients with and without CRS, CRS patients were not at increased risk of re-operation ($p=0.903$), epiphora ($p=0.133$), or nasolacrimal duct stenosis ($p=0.0502$).

Conclusions:
A history of underlying CRS was not associated with an increased risk of operative failure for patients undergoing endoscopic DCR.

Poster# ARS049

Efficient estimation of SNOT-22 total score using a short-item decision tree model

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Background:
Survey burden is significant with frequent administration of long questionnaires such as the 22-item Sinonasal Outcome Test (SNOT-22), limiting survey accuracy and clinical utility. Prior efforts to reduce burden have produced several static short-form versions of the SNOT-22, but have not evaluated whether tailored tests, which can make accurate predictions with fewer items, can efficiently predict SNOT-22 outcomes. A decision tree model is one potential approach which requires less computational overhead than adaptive models.

Methods:
A dataset of 2,005 anonymized SNOT-22 surveys from recent clinical encounters was divided into training (n=1605) and validation sets (n=400). Seven decision tree models were developed using Classification and Regression Tree (CART) and Chi-squared Automatic Interaction Detector (CHAID) methodologies. Each model was trained to predict the total SNOT-22 score and subsequently evaluated on the validation set.

Results:
Among the evaluated models, CART demonstrated the best performance, predicting total SNOT-22 scores a median of 4.4 points from measured values (mean = 6.0) while only requiring eight or fewer item responses. This prediction error falls within established minimal clinically important difference guidelines (8.9-12 points) for the SNOT-22.

Conclusion:
Decision tree models show strong potential for accurately estimating sinonasal symptom burden while substantially reducing patient survey burden. These findings support the feasibility of integrating low-computational, short-item decision trees into routine clinical assessment of chronic rhinosinusitis.

Poster# ARS050

Electronic versus paper SNOT-22 scores in CRS patients

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Introduction:
The Sino-Nasal Outcome Test-22 (SNOT-22) is a validated patient reported outcome measure (PROM) for chronic rhinosinusitis (CRS) that assesses the health burden of CRS on quality of life. The SNOT-22 is widely used and has been validated in many languages; however, an electronic version has yet to be validated. The purpose of our study is to determine if scores from an electronic form differ from traditional paper scores.

Methods:
Adult CRS patients (≥18 years old) who completed the electronic version of the SNOT-22 (sent via Epic MyChart 7 days prior to their appointment) and the paper version at their clinic appointment (April-August 2025) were included. Demographic variables collected included age, sex, and race. The score difference between the electronic and paper version, as well as the duration between completion of the two versions (days, hours, minutes) was calculated.

Results:
150 sets of SNOT-22 data were collected via retrospective chart review. The mean age was 54.3 ± 6.4 years old. 57.3% (n=86) of patients were female and 42.7% (N=64) were male. 52% (n=78) had nasal polyps. On average, patients completed the electronic and paper versions 3 days and 15 hours from each other (range: 11 minutes to 7 days, 7 hours). The mean absolute difference between the two versions was 6.9 ± 6.4 (range 0 to 29). 30% (n=45) of patients had a difference greater than or equal to 8.9 (minimal clinically important difference [MCID]).

Conclusion:
The electronic SNOT-22 scores differ from the paper version, with nearly one-third of data sets showing a difference greater than or equal to the MCID. This raises into question the reliability of the electronic version of the SNOT-22 and deserves further study.

Poster# ARS051

Environmental exposures on rhinosinusitis using COSMOS data

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Background:
Air pollution has been linked to sinonasal diseases, but broader environmental contributors remain understudied using clinician-verified diagnoses at a population scale. This study examined associations between annual PM2.5, temperature, altitude, and allergic rhinitis (AR), acute sinusitis (AS), and chronic sinusitis (CRS) across ten cleanest and ten most polluted U.S. cities per the American Lung Association (ALA).

Methods:
Epic COSMOS provided 200 city-year observations (20 cities, 2014-2024). Outcomes were annual city-level percentages of AR, AS, and CRS. Exposures included annual PM2.5 (ALA), altitude (USGS), and mean temperature (NCEI). Analyses used descriptive comparisons and linear models.

Results:
Polluted cities had higher PM2.5 (13.9 vs 5.0 $\mu g/m^3$), warmer temperatures (14.2 vs 11.9 °C), and lower altitudes (110 vs 898 m). They also had higher AR (2.49% vs 1.78%, $p<0.0001$), CRS (1.16% vs 0.98%, $p<0.001$), and AS (0.52% vs 0.60%, $p<0.0001$). PM2.5 was positively but nonsignificantly associated with AR ($\beta=0.042$, $p=0.18$). Higher temperature was linked to higher AR ($\beta=0.050$, $p<0.001$), while altitude was inversely associated ($\beta=-0.00055$, $p=0.002$). For AS, PM2.5 showed a significant association ($\beta=0.028$, $p=0.011$). For CRS, PM2.5 and temperature were positive but nonsignificant ($\beta=0.012$, $p=0.21$; $\beta=0.0053$, $p=0.058$). No significant exposure interactions were detected.

Conclusion:
Across U.S. cities, PM2.5, temperature, and altitude showed distinct associations with AR, AS, and CRS. PM2.5 was positively associated with all three, reaching significance for AS, while temperature and altitude were significant predictors for AR. Multiple environmental exposures may differentially influence sinonasal disease burden.

Poster# ARS052

Eosinophilia in odontogenic sinusitis

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Introduction:
Significance of eosinophilic odontogenic sinusitis (eOS) is ill-defined since OS is traditionally non-eosinophilic. We compared eOS, non-eOS (neOS), and primary diffuse eosinophilic CRS (eCRS) patients to evaluate these proposed associations.

Methods:
Unified medical records were reviewed to identify OS and primary diffuse CRS patients between 01/2024-11/2025 who underwent ESS, had structured histopathology reports, and >6 months follow-up. Patients were divided as eOS (>10 eosinophils/hpf), neOS (<10 eos/hpf), and eCRS. Demographics, clinical, radiological, and histopathological markers were compared.

Results:
We included 81 patients (20 eOS, 40 neOS, and 21 eCRS). eCRS patients were younger [median 57 years vs. 66.5 (eOS) and 71 (neOS); p=0.05] and had higher Lund-Mackay scores (median 11 vs. 7.5 and 6; p<0.001). Sex distribution, smoking, type-2 comorbidities, pre-ESS steroid use, serum eosinophils, and rhinologic SNOT-22 scores did not differ between groups. Tissue neutrophils and culture positivity were significantly lower in eCRS but comparable between eOS and neOS. Degree of tissue eosinophilia was similar between eOS and eCRS (moderate: 10-100/hpf; marked: >100/hpf).
Direct comparison of eOS and neOS groups showed no differences in any variables including CRS and dental implantation history, isolated maxillary sinusitis, tissue neutrophilia, or post-ESS improvements in SNOT-22 scores. Multivariate analysis identified no independent predictors.

Conclusions:
eOS did not exhibit distinct clinical, radiologic, or histopathologic characteristics, and association with type-2 inflammation compared with neOS. Larger prospective studies are needed to refine clinical relevance of this proposed endotype.

Poster# ARS053

Epistaxis and antithrombotic therapy: Outcomes from the nationwide emergency department sample

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Objectives:
There is limited data on epistaxis presentation and management patterns in U.S. emergency departments (ED). We aim to characterize patients who present to the ED with epistaxis and identify factors associated with anticoagulant or antiplatelet therapy.
Study design: Retrospective review of Nationwide Emergency Department Sample (NEDS) from 2018 to 2022.

Methods:
NEDS was queried for patient visits with a primary diagnosis of epistaxis (ICD-10-CM code R04.0) and a secondary diagnosis of anticoagulation use (Z79.01) or antiplatelet use (Z79.02). CPT codes were used to identify concomitant procedures. Patient demographics, comorbidities, and hospital characteristics were also obtained.

Results:
There were 633,606 ED visits for epistaxis, with a decrease in incidence of 4.66% per year from 2018-2022. 10.67% of patients were on long-term anticoagulation alone, 2.45% were on long-term antiplatelet therapy alone, and 0.4% of patients were on both.
Logistic regression showed that antithrombotic use was associated with more frequent packing (OR=1.20) but fewer endoscopies and surgical procedures (OR=0.83). Any antithrombotic use was also associated with lower odds of death compared to using neither (OR=0.40), an association that was significant even after adjusting for procedure type.

Conclusion:
For patients presenting to the ED for epistaxis, the use of any antithrombotic is associated with decreased odds of death and less invasive management. This could be due to the reversible nature of antithrombotic therapy compared to some potentially complex pathology behind other causes of epistaxis. Future studies should explore if these findings persist with different types of antithrombotics, such as warfarin or clopidogrel.

Poster# ARS054
WITHDRAWN

Poster# ARS055
ESS for odontogenic sinusitis meta-analysis
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Background:
Odontogenic Sinusitis (ODS) is a common cause of chronic rhinosinusitis (CRS). Endoscopic sinus surgery (ESS) and dental interventions are treatment modalities to address ODS. The efficacy of ESS for ODS remains incompletely defined.

Objective:
To systematically review and synthesize evidence on the outcomes of ESS in patients with ODS.

Methods:
A systematic search of PubMed, Web of Science, and Embase was conducted from inception to September 2025, following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines. Studies reporting post-operative outcomes and recurrence were included.

Results:
Thirty-eight studies encompassing 2,771 ODS patients were analyzed. A total of 1,489 patients underwent ESS alone, 971 patients underwent ESS with dental intervention, and 311 patients underwent dental intervention alone. Follow-up duration ranged from one to 25.2 months (mean, 10 months). Success was defined based on symptomatic improvement, imaging, or endoscopic exam. Success was achieved in 1301 patients (94.6%) who underwent ESS alone, 965 patients (89.0%) who underwent ESS with dental intervention, and 219 patients (75.5%) who underwent dental intervention alone. A total of 150 patients (5.4%) underwent revision surgery, 42.7% repeat dental procedures, 40% revision ESS, and 17.3% unspecified revision surgery.

Conclusion:
ESS is an effective treatment modality for ODS. A multidisciplinary approach to ODS is critical for optimal outcomes. Additional study is necessary to determine root causes for failure.

Poster# ARS056

Evaluating AI concordance with CRS surgery guidelines

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Background:
As patients rely more on large language models (LLMs) for Chronic Rhinosinusitis (CRS) diagnosis, surgical candidacy, and perioperative care, evaluating the accuracy of LLM-generated information against 2025 American Academy of Otolaryngology–Head and Neck Surgery plain-language guideline on Surgical Management of CRS is essential.

Methods:
ChatGPT, Google AI, Google Gemini, and Grok were queried using a 21-question guideline-mapped prompt set (long) and a single patient-focused prompt (short). Two physician reviewers scored responses using a 3-point rubric across 21 fields. Primary outcomes were guideline-concordant scores; secondary outcomes included readability measured with the Flesch Reading Ease (FRE) and Flesch-Kincaid Grade Level (FKGL). Inter-rater reliability (IRR) was assessed using the intraclass correlation coefficient (ICC). Analyses were performed in SPSSv31.

Results:
Guideline concordance ranged from 55.36% to 77.98% ($p>0.05$), highest for Grok (77.98%, 95% CI 63.67–92.28), followed by Google Gemini (66.67%, 95% CI 35.42–97.91), ChatGPT (55.95%, 95% CI 29.25–82.65), and Google AI (55.36%, 95% CI 29.97–80.75). Prompt structure significantly affected scores, with long prompts outperforming short prompts (+26.19, $p<0.001$). FRE was highest and FRE was lowest (easiest to read) for Google Gemini and ChatGPT (FRE 39.25, 39.85 and FKGL 10.20, 10.50 respectively) ($p>0.05$). IRR was high (ICC=0.961).

Conclusion:
LLMs demonstrated similar guideline concordance, suggesting patients can expect comparable accuracy across platforms. However, longer prompt structure meaningfully influenced output quality highlighting how user ability to frame precise prompts is critical to obtaining accurate information.

Poster# ARS057

Evaluating artificial intelligence models for patient education on nasal polyps

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Rationale:
Patients and clinicians increasingly use Artificial Intelligence (AI) for guidance on rhinologic conditions such as nasal polyps. We evaluated how well several Large Language Models (LLMs) provided accurate, relevant, understandable, and safe responses to common nasal polyp questions.

Methods:
Top nasal polyp queries were identified through Google Trends from June 2023 to July 2025. Nine queries were entered into three widely used LLMs (ChatGPT 5o, Gemini 2.5 Pro, and Open Evidence). Otorhinolaryngology and allergy clinicians scored each response using a standardized 1.0–3.0 rubric assessing accuracy, relevance, up to date information, understandability, and clinical safety. Model performance differences were analyzed with Kruskal–Wallis testing and false discovery rate–adjusted post hoc comparisons.

Results:
All models averaged above 2.5/3.0 for accuracy, relevance, up to date information, and safety. Open Evidence scored highest for accuracy (2.8) and up to date information (2.6). Gemini scored highest for relevance (3.0) and safety (2.6). GPT 5o scored highest for understandability (3.0). GPT 5o and Gemini were significantly more understandable than Open Evidence ($p<0.0001$). Open Evidence outperformed others in accuracy ($p=0.008$) and up to date information ($p=0.04$). Gemini outperformed GPT 5o in relevance ($p=0.007$). No significant differences were found in safety.

Conclusion:
LLMs show promise for delivering accurate and safe clinical information about nasal polyps. Open Evidence produced the most accurate and current content, while ChatGPT 5o and Gemini generated more understandable responses. Platform specific strengths suggest that optimal use of AI for clinical education may depend on the model selected.

Poster# ARS058

Evaluating biologic use for chronic rhinosinusitis with nasal polyposis: A population study

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Background:
Biologics provide another treatment option for patients with chronic rhinosinusitis with nasal polyposis (CRSwNP), though their safe use requires careful patient selection. This study analyzed biologic use for CRSwNP before and after FDA approval, identified prescribing differences in physician specialties, and characterized instances of subsequently diagnosed non-polyp sinonasal lesions.

Methods:
Retrospective claims-based study of patients in the MarketScan Commercial Database and the Medicaid Administrative Database who had a diagnosis of CRSwNP and prescribed a biologic.

Results:
6,929 patients with a diagnosis of CRSwNP who received a biologic were identified. Biologic use increased 165%, from 1,897 to 5,032 patients, after FDA approval of the first biologic for nasal polyps, with only a modest increase in frequency of otolaryngologist evaluation (relative risk [RR]: 1.19), and nasal endoscopy (RR: 1.42). 3,125 of 5,032 (62.10%) patients received a nasal endoscopy before biologic administration. 2,472 out of 3,046 (81.16%) patients seen by an otolaryngologist received an endoscopy, while only 653 of 1,986 (32.88%) patients seen by a non-otolaryngologist received an endoscopy (RR: 2.47). 190 non-polyp lesions were identified.

Conclusions:
Though biologic use in patients with CRSwNP more than doubled after FDA approval for nasal polyps, rates of otolaryngology evaluation and nasal endoscopy did not increase commensurately. Nearly 40% of patients in this cohort did not receive a nasal endoscopy. Misdiagnosis of CRSwNP, though rare, is a distinct possibility and puts patients at increased risk. We recommend a multi-disciplinary approach to ensure patient safety and limit inappropriate biologic utilization.

Poster# ARS059

Exploring sleep quality and chronic rhinosinusitis risk using wearable technology

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Introduction:
Chronic rhinosinusitis (CRS) is a prevalent sinonasal inflammatory condition. The pathogenesis of CRS is multifactorial, with sleep emerging as a possible yet understudied contributor.

Methods:
We performed a retrospective study using Fitbit-based sleep data associated with electronic medical records in the All of Us Research database. Adults aged ≥18 with at least six months of Fitbit sleep data prior to CRS diagnosis were included. Sleep quality metrics (sleep irregularity, sleep efficiency, and REM-to-non-REM ratio) were binned into tertiles with equal amounts of sleep nights. CRS was defined via ICD-10 coding. Time-varying Cox regression models, adjusted for demographics and comorbidities, estimated hazard ratios (HRs) and 95% confidence intervals (CIs) for incident CRS across sleep metric categories.

Results:
The cohort included 332 CRS cases and 9499 controls. HRs and 95% CIs were estimated by comparing sleep periods in the higher tertiles of each sleep metric with the lower tertiles. Participants with the highest sleep irregularity had an increased risk of CRS as compared to the reference group (lowest sleep irregularity tertile) (HR = 1.79, 95% CI 1.73 - 1.86). Greater sleep efficiency was associated with lower risk of CRS (0.80, 0.78-0.83). Individuals with a higher REM-to-non-REM ratio also had a lower likelihood of CRS (0.78, 0.74-0.82).

Conclusion:
To our knowledge, this is the first study utilizing longitudinal sleep data to explore the association between sleep metrics and CRS risk. Greater sleep irregularity, lower sleep efficiency, and lower REM-to-non-REM ratio were associated with increased CRS risk, suggesting sleep quality is a potential behavioral intervention for CRS.

Poster# ARS060

Extent of surgery in recurrent acute sinusitis

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Introduction:
Patients with recurrent acute rhinosinusitis (RARS) often undergo functional endoscopic sinus surgery (FESS). However, the optimal extent of surgery remains unclear. We compared postoperative outcomes between complete and partial FESS.

Methods:
A retrospective review was conducted of patients with RARS who underwent complete or partial FESS. Demographics, comorbidities, radiologic, and clinical data were collected. The primary outcome was sinusitis episodes, as denoted by history or antibiotic prescriptions. Analysis included Poisson/logistic regression and Kaplan–Meier survival analysis.

Results:
195 patients (157 partial FESS, 38 complete FESS) were included. Partial-FESS typically included bilateral maxillary antrostomy with anterior ethmoidectomy. Follow-up average was 36±42 months for partial FESS and 25±28 months for complete FESS. Preoperatively, the complete FESS group had higher CT Lund-McKay score (1.7 vs 3.9, p=0.0007), endoscopic Lund Kennedy score (0.77 vs. 1.9, p=0.0001), and SNOT-22 scores (44.3 vs 53.9, p=0.016). Mean annual postoperative sinusitis episodes was 0.6±1 for partial FESS and 0.3±0.6 for complete FESS. There was no difference in risk of sinusitis episodes (IRR=0.73, p=0.31). Kaplan–Meier analysis showed a trend toward lower cumulative recurrence risk with complete FESS but was not statistically significant (HR=0.51 at 30 months, p=0.07, HR=0.6 at 60 months, p=0.12).

Conclusion:
Extent of FESS for RARS may not impact subsequent frequency of sinusitis. Interpretation is limited by the retrospective design and underpowered by the small cohort of complete FESS. Complete FESS may still be appropriate for selected patients. Prospective studies are needed to confirm these findings.

Poster# ARS061

Factors associated with sinonasal surgical scheduling in chronic rhinosinusitis

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Objective:
To evaluate factors associated with delayed scheduling after initial surgical recommendation for endoscopic sinus surgery in chronic rhinosinusitis (CRS).
Background: While timing and outcomes of endoscopic sinus surgery for CRS have been studied, little is known about scheduling behavior after surgical recommendation. We hypothesized that demographic and disease-specific factors would be associated with delayed scheduling.

Methods:
This study was a single-center retrospective cohort of adults (≥18 years) with CRS receiving a first-time recommendation for primary endoscopic sinus surgery between January–October 2025. Surgical decision was classified as declined, deferred, or elected. Among those who elected, scheduling was categorized as immediate (≤1 day) or delayed (>1 day). Demographics, Functional Comorbidity Index (FCI), CRS features, and SNOT-22 were collected. Group comparisons and logistic regression assessed predictors of delayed scheduling.

Results:
Of 204 patients, 14 (6.9%) declined, 26 (12.7%) deferred, and 162 (80.4%) elected. Among elected patients with scheduling data (n=150), 96 (64%) scheduled immediately and 54 (36%) delayed. Delayed schedulers were older (53.2 vs 46.9 years), more often non-English speakers (13.0% vs 5.2%), and had lower rates of allergic rhinitis (28.3% vs 45.3%). In univariate analysis, older age (OR 1.02, p=0.049) and absence of allergic rhinitis (OR 0.48, p=0.045) were associated with delay.

Conclusions:
Over one-third of CRS patients who elected surgery delayed scheduling. Older age was associated with higher odds of delay, suggesting possible age-related barriers. Disease severity, comorbidity, and SNOT-22 were not associated with scheduling behavior.

Poster# ARS062

GLP-1 agonists in IIH

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Introduction:
Weight loss is a key component of managing idiopathic intracranial hypertension (IIH) with cerebrospinal fluid (CSF) rhinorrhea. Glucagon-like peptide 1 receptor agonists (GLP-1 RAs) have emerged as a revolutionary treatment for obesity and type II diabetes mellitus (T2DM) with evidence for symptomatic benefit among IIH patients.

Methods:
A retrospective study of all patients undergoing endoscopic repair of idiopathic CSF rhinorrhea leak between 1/2015-7/2025. The study time period was selected to start the year following first GLP-1RA approval for treatment of obesity. Variables included GLP-1 RA utilization and candidacy as well as body mass index (BMI). GLP-1 RA candidacy was defined as BMI ≥30 or BMI ≥27 and a weight-related condition, reflecting current indications for GLP-1RAs.

Results:
52 (75.4%) of 69 patients were eligible for GLP-1 RA with only 5 (9.6%) eligible patients on a GLP-1RA at time of repair; 1 (2%) was started post-operatively. Indications for GLP-1RA treatment include BMI ≥ 30 most commonly in 43 patients (62.3%) and BMI ≥ 27 and a weight-related condition in 8 patients (11.6%): HTN (7 subjects), T2DM (4), CVD (1), and current smoker (1). 1 patient did not meet BMI criteria but had prior gastric bypass. The mean patient BMI at time of repair was 32.78 with mean BMI change from repair was +0.02 at 3 months (p=0.94), -0.14 at 6 months (p=0.67), and -0.23 at 12 months (p=0.64).

Discussion:
The vast majority of patients undergoing endoscopic repair for idiopathic CSF rhinorrhea are candidates for GLP-1RA treatment. Our findings show that the current paradigm of encouraging weight loss is not associated with a significant decrease in BMI. GLP-RAs may represent an underutilize adjunctive treatment.

Poster# ARS063

GLP1 therapy - prospective evaluation of smell and taste

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Background:
Glucagon-like peptide-1 (GLP-1) receptor agonists are widely prescribed for diabetes and weight management. Patients report altered taste perceptions after treatment initiation. Recent evidence demonstrating GLP-1 receptor expression within the olfactory bulb suggests a potential link to chemosensory modulation.

Objective:
To evaluate changes in olfactory and gustatory function and patient-reported outcomes following GLP-1 agonist treatment.

Methods:
prospective observational study enrolled consecutive adult patients initiating GLP-1 therapy without sinus comorbidities. Baseline testing included the Sniffin' Sticks TDI, UPSIT, standardized taste strip assessments, and validated patient-reported outcome measures addressing olfaction and nasal breathing. Follow-up testing was performed after patients achieved ≥5% weight loss or reached their maximal tolerable GLP-1 dose. Changes were compared between time points.

Results:
of 25 study participants, 10 patients have achieved therapeutic goals and were re-evaluated. GLP-1 therapy was not associated with statistically significant changes in global olfactory performance across TDI and UPSIT scores, nor in overall gustatory function or PROMS. However, subtle, non-significant trends toward lower odour identification scores were observed in both TDI assessments.

Conclusion:
Although no significant chemosensory differences were identified after GLP-1 initiation, observed trends toward reduced odor identification suggest a possible early sensory effect.

Poster# ARS064

GLP-1 therapy is associated with reduced CRS treatment burden in patients with obesity

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Background:
Glucagon-like peptide-1 receptor agonists (GLP-1s) are widely used for treating obesity and metabolic disease due to their weight-loss and anti-inflammatory effects. Obesity related inflammation is linked to higher chronic rhinosinusitis (CRS) prevalence and symptom burden. We evaluated whether GLP-1 use in obese adults with CRS was associated with lower treatment utilization, used as a proxy for disease burden, compared with matched non-users.

Methods:
Using TriNetX EHR data, we identified adults with CRS and obesity (BMI >30) who started a GLP-1 after CRS and obesity diagnoses and compared them with non-users. Patients with prior FESS were excluded. Outcomes at 1, 3, and 5 years included use of intranasal steroids (INCS), oral steroids, antibiotics, biologics, and any therapy. Cohorts were propensity score matched by demographics, BMI, and comorbidities.

Results:
At 1 year, GLP-1 users had lower use of antibiotics (OR 0.86 [0.83-0.89], p<.001), oral steroids (OR 0.76 [0.73-0.78], p<.001), INCS (OR 0.83 [0.78-0.88], p<.001), and any therapy (OR 0.78 [0.75-0.79], p<.001); however higher biologic use was higher (OR 1.61 [1.39-1.89], p<.001). At 3 years, this trend continued with lower use of antibiotics (OR 0.78), oral steroids (OR 0.65), INCS (OR 0.81), and any therapy (OR 0.67), while biologic use remained elevated (OR 1.27). At 5 years, GLP-1 users had lower utilization of non-biologic therapies, while biologic use no longer differed between cohorts (OR 1.06 [0.94-1.19], p=.343).

Conclusion:
In obese adults with CRS, GLP-1 use was linked to reduced reliance on several non-biologic therapies and higher biologic use. These findings suggest GLP-1 therapy may reduce treatment burden in CRS.

Poster# ARS065

Healthcare provider preferences for biologic attributes in chronic rhinosinusitis with nasal polyps

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Background:
Biologics have shown efficacy in chronic rhinosinusitis with nasal polyps (CRSwNP) but vary in dosage and attributes. This study explored healthcare provider (HCP) preferences for the frequency and location of biologic administration and the importance of treatment attributes.

Methods:
This cross-sectional, non-interventional, online survey asked US HCPs to indicate their preferences for the frequency (every 4 weeks [Q4W] vs every 2 weeks [Q2W]) and location (at-home vs in-clinic) of CRSwNP biologic administration and explain their rationale, and to rank treatment attributes. Eligible HCPs had ≥3 years' experience in treating CRSwNP and treated ≥50 patients annually (≥25 severe). Data were summarized descriptively.

Results:
Overall, 102 HCPs completed the survey: allergists, n=50 (49.0%); otolaryngologists (ENTs), n=33 (32.4%); and pulmonologists, n=19 (18.6%). Most HCPs (96.1% [allergists, 100%; ENTs, 93.9%; pulmonologists, 89.5%]) preferred dosing Q4W vs Q2W. At-home administration was preferred to in-clinic by 66.7% of HCPs (allergists, 52.0%; ENTs, 84.8%; pulmonologists, 73.7%). Patient convenience was the main reason HCPs preferred Q4W (93.9%) and at-home dosing (95.6%). Treatment attribute rankings were broadly consistent between specialties: efficacy was most important (74.5%), then side-effect risk (38.2%) and speed of onset (35.3%).

Conclusion:
Across specialties, HCPs favored Q4W dosing, primarily for patient convenience. Two-thirds of HCPs preferred at home to in-clinic administration, highlighting the value of having both options. Efficacy was the most important treatment attribute. These findings show that HCPs value biologics that combine clinical efficacy with patient-centered delivery.

Poster# ARS066

Histopathology and treatment of recalcitrant purulent rhinosinusitis

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Introduction:
Recalcitrant Purulent Rhinosinusitis (RPR) represents a population of patients with purulence and edema persisting for at least 3 months after complete functional endoscopic sinus surgery (FESS) despite 3 rounds of post-surgical antibiotics, oral steroids, and steroid rinses. By identifying structured histopathology (SHP) trends in RPR patients and RPR patients who respond to long term azithromycin therapy, we aim to understand how changes in tissue architecture influence disease pathophysiology and potential management.

Methods:
Retrospective chart review was conducted on patients who underwent FESS. Data was collected on SHP, demographics, and comorbidities. Cohort was divided into RPR and non RPR controls. RPR patients were trialed on long-term azithromycin therapy. Perioperative and pre-azithromycin treatment culture was collected on RPR patients.

Results:
25 patients with RPR and 496 non RPR control patients were included. RPR was associated with increased moderate-severe degree of inflammation (80.0% vs 16.5% $p<0.011$), subepithelial edema (88.0% vs 64.4% $p<0.015$), and decreased eosinophil aggregation (4.0% vs 22.5% $p<0.028$). Of 21 RPR patients with perioperative culture, 6 (28.6%) grew P. Aeruginosa, 8 (38.1%) grew S. Aureus, and 9 (42.9%) grew coagulase negative Staphylococcus (CNS) species. 13 RPR patients were trialed on long-term azithromycin therapy. 11 (84.6%) demonstrated disease clearance endoscopically, 3 grew P. Aeruginosa and 4 grew S. Aureus on pretreatment culture. 2 nonresponders grew S. Aureus.

Conclusion:
RPR is associated with significant changes in several SHP variables that may influence the disease pathogenesis. Long term azithromycin therapy may be effective in this population.

Poster# ARS067

Impact of ambient dictation AI on documentation burden and patient satisfaction

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Background:
Otolaryngology is a highly office-based specialty where high outpatient volumes drive substantial documentation burden, a known contributor to workflow inefficiency and physician burnout. Ambient dictation and AI note-writing tools have emerged as potential solutions, with early studies in non-surgical fields showing gains in documentation efficiency and patient satisfaction. We evaluated the impact of an ambient dictation AI tool on documentation efficiency and patient experience in an otolaryngology clinic by comparing performance metrics before and after implementation.

Methods:
A retrospective review included all in-person encounters with a single rhinologist over two 1.5-year periods before and after AI adoption. Outcomes included Press Ganey scores, chart closure time, after-hours documentation time, note length, visit duration, and patient wait time.

Results:
Ambient AI implementation reduced chart closure time and after-hours documentation, with a small increase in note length. Visit duration and patient wait times remained stable, preserving workflow and throughput. Patient experience, measured by Press Ganey scores, demonstrated modest improvement.

Conclusion:
Ambient dictation AI improved documentation efficiency by decreasing after-hours administrative time and accelerating chart completion without disrupting visit flow or patient satisfaction. By generating draft notes rapidly, AI-assisted documentation may ease workload and help mitigate clinician burnout. Findings support broader evaluation and adoption of ambient AI tools to enhance efficiency and sustain high-quality care in surgical outpatient practice.

Poster# ARS068

Impact of dupilumab on infection burden and antibiotic use in CRSwNP and asthma

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Introduction:
Dupilumab decreases medication utilization in asthma and chronic rhinosinusitis with nasal polyps (CRSwNP), but few studies describe its impact on infection and antibiotic reduction. Antibiotic exposure is a key driver of antimicrobial resistance. Whether improved type 2 inflammation control, reduced polyp burden, and better mucociliary clearance translate into fewer infections remains unclear. We examined the effect of dupilumab on infections and antibiotic utilization in CRSwNP and/or asthma.

Methods:
Retrospective cohort of 209 patients treated with dupilumab for CRSwNP and/or asthma (2018–2024) at a single institution. Infection-related encounters requiring systemic antimicrobials were recorded 1 year before and after initiation and categorized by site and antibiotic class.

Results:
Dupilumab reduced mean infections from 1.59 to 0.95 per patient (IRR 0.597, 95% CI 0.50–0.71; p<0.001), a 40% decrease. Antibiotic use was decreased by 5 days (7.72 vs 12.74; p<0.001) in the first year. The largest reductions were in fluoroquinolone exposure (IRR 0.358, 95% CI 0.14–0.94; p<0.001) and in sinus (IRR 0.468, 95% CI 0.36–0.62; p<0.001) and lower respiratory infections (IRR 0.451, 95% CI 0.24–0.84; p<0.05). Patients with both CRSwNP and asthma had greater reductions in antibiotic days than asthma alone (-7.6 vs -0.39; p<0.05). In asthmatics, higher baseline eosinophil counts trended towards significant antibiotic reduction (p=0.054).

Conclusions:
Dupilumab was associated with reductions in infections and antibiotic exposure, especially in patients with both asthma and CRSwNP. In infection-prone phenotypes, incorporating antibiotic reduction benefits into patient counseling and when considering biologics may be beneficial.

Poster# ARS069

Impact of effective CFTR modulators on extent of ESS among CF patients

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Background:
Chronic rhinosinusitis (CRS) is prevalent among cystic fibrosis (CF) patients and managed by oral/intranasal medication, systemic CFTR modulators, and endoscopic sinus surgery (ESS). Little data exists regarding the impact of effective CFTR modulators – elexacaftor-tezacaftor-ivacaftor (ETI), ivacaftor alone, and vanzacaftor-tezacaftor-deutivacaftor (VTD) – on incidence and extent of ESS among CF patients.

Methods:
Retrospective analysis of CF patients from 2012-present in TriNetX stratified into effective (ETI, ivacaftor, VTD), dual (lumacaftor-ivacaftor, tezacaftor-ivacaftor), and no modulator groups propensity score-matched by demographics, nasal polyposis, sweat chloride, and lung transplant history. Outcome variables included sinus debridement, any ESS, maxillary antrostomy, ethmoidectomy, sphenoidotomy, and frontal sinusotomy. Analyses were performed among all, only adult, and only pediatric patients.

Results:
Unmatched cohort (n=52,144) was largely female (54.5%), White (73.8%), adult (80.1%), and with a mean age of 47 (SD=23). Average sinuses opened among ESS patients varied minimally by modulator (effective=2.68, dual=2.49, none=2.65). Post-match, those on effective modulators were less likely than no-modulator patients to undergo debridement, any ESS, maxillary antrostomy, ethmoidectomy, sphenoidotomy, and frontal sinusotomy (all p<0.01). Aside from frontal sinusotomy, differences persisted among adults (all p<0.05) but not among children or between effective and dual modulators; these cohort sample sizes were small.

Conclusion:
Effective CFTR modulators may reduce need for and extent of ESS, especially among adults. Utility among pediatric patients and relative to dual modulators requires future study.

Poster# ARS070

Impact of FESS on nasal saline irrigation volume retention

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Background:
Functional endoscopic sinus surgery (FESS) improves sinus ventilation and enhances the effectiveness of topical therapies, including high-volume saline irrigation (HVSI). Postoperatively, HVSI is frequently used to deliver corticosteroids or antibiotics to the sinonasal mucosa, but little is known about actual drug delivery or the volume of irrigant retained in the sinuses. This study compares retention volume after HVSI between patients with and without a history of FESS.

Methods:
38 patients who regularly perform HVSI were enrolled. Participants were excluded if they had an active infection, were <1-month post-operation, or had a history of sinonasal cancer or skull base surgery. Each participant performed 240 mL HVSI and effluent was collected in a large basin. Volume was approximated from mass using a density of 1.0 g/mL. Volume retained was calculated as (initial volume - collected volume - residual bottle volume), while percent retention was calculated as volume retained/(initial volume - residual bottle volume). Unpaired, two-tailed t-tests compared groups for significance.

Results:
Mean percent retention for FESS patients (n=26) was significantly greater than non-FESS patients (n=12) (7.4 ± 4.1% vs 4.3 ± 2.4%, p=0.020). Among FESS patients, those with middle turbinate resection (n=15) had higher, yet non-significant, retention than those without resection (n=8) (8.7 ± 4.5% vs 5.3 ± 2.8%, p=0.066).

Conclusion:
Patients with a prior FESS retain significantly greater volume after HVSI. Middle turbinate resection may further increase retention.

Poster# ARS071

Impact of FESS on the incidence of mental health outcomes in CRS: A real-world database study

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Objectives:
This study aimed to: 1) Compare the incidence of new mental health diagnoses in CRS patients who underwent FESS versus those who did not. 2) Quantify the relative risk and absolute risk difference of mental health outcomes between surgically and non-surgically managed cohorts. 3) Assess time-to-event for mental health diagnoses.

Study design:
This retrospective cohort study compared new mental health diagnosis incidence in adult CRS patients with versus without FESS. From the TriNetX Research Network, 78,692 CRS patients without prior mental health disorders were included; 39,346 underwent FESS. CRS diagnoses were accompanied by objective imaging/endoscopy; mental health diagnoses were confirmed by treatment (psychiatry visit/medications). Propensity score matching balanced baseline characteristics. Mean follow-up was 1,551 days (non-FESS) and 1,457 days (FESS). Measures of association and Kaplan-Meier survival analysis assessed outcome incidence and time-to-event.

Results:
38,703 FESS-treated CRS patients were compared to 34,511 propensity-score-matched non-FESS CRS patients. Mental health outcome incidence was significantly lower in the FESS cohort (8.033%) versus non-FESS (17.113%). Absolute risk difference was 9.1% (95% CI: 8.6-9.6%, $p < 0.0001$). Risk ratio showed non-FESS patients were 2.13 times (95% CI: 2.05-2.22, $p < 0.0001$) more likely to receive a mental health diagnosis.

Conclusion:
In this large, real-world cohort, FESS was associated with significantly lower mental health outcome incidence in CRS patients. These findings suggest surgical management may offer substantial holistic benefits, warranting further evaluation of mental health as an outcome in CRS treatment strategies.

Poster# ARS072

Impact of inflammatory bowel disease on CRS outcomes

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Introduction:
In a small study, it was shown that chronic rhinosinusitis (CRS) symptoms are worse in patients with inflammatory bowel disease (IBD). In our experience, patients with CRS and IBD tend to have worse sinonasal outcomes. It was previously proven that functional endoscopic sinus surgery (FESS) for CRS improves ulcerative colitis (UC) symptom scores and histologic colonic mucosal biopsies. The reverse, that IBD worsens CRS outcomes, has not been investigated.

Objectives:
To compare CRS outcomes in patients with CRS and IBD (CRS+IBD) and CRS alone.

Methods:
An age- and sex-matched cohort study of patients with CRS+IBD and CRS alone who underwent FESS at a tertiary care center from 2019-2024 was performed. Statistical comparisons of pre- and post-operative data were performed using conditional logistical regression, Cox proportional hazards regression, and Wilcoxon rank sum tests.

Results:
Forty-two cases (CRS+IBD) and 42 matched referents (CRS) were included. Most patients did not have polyps (n=47, 56%). SNOT-22 and LK scores were not statistically significantly different between groups pre- or post-operatively. CRS+IBD patients were more likely to have elevated neutrophil levels in sinus specimens (77% vs 35%, p=0.02). Seven patients with CRS+IBD underwent revision surgery versus 5 with CRS alone (HR 1.67, 95% CI 0.40-6.97, p=0.5). Among those with IBD, patients with UC had better SNOT-22 scores in the early (median 16.5 vs 31, p=0.04) and late (median 24 vs 35, p=0.04) postoperative period than with Crohn's disease.

Conclusion:
Patients with CRS and IBD, especially those with Crohn's disease, should be adequately counseled on the possibility of worse sinonasal symptoms given their predisposition to tissue inflamma

Poster# ARS073

Impact of silent sinus syndrome on structured histopathology

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Background:
Silent sinus syndrome (SSS) is a rare chronic sinus condition characterized by enophthalmos and maxillary atelectasis. The structured histopathologic features (SHP) of SSS has not been described in relation to chronic rhinosinusitis with (CRSwNP) and without polyps (CRSsNP).

Methods:
Retrospective review was performed on SHP, demographics, comorbidities, preoperative symptoms, and radiographic features in 1,195 patients (mean age 52.9; BMI 29.3; 56.4% female). Nineteen had SSS, the remainder had CRSsNP or CRSwNP. Chi-squared, Independent T tests, and multinomial regressions were performed.

Results:
Compared to CRS, SSS showed significantly reduced inflammation ($p = 0.001$), eosinophil counts ($p = 0.001$), neutrophil infiltration ($p = 0.018$), and eosinophil aggregates ($p = 0.022$). All remained significant after adjusting for asthma, diabetes, smoking, and BMI. SSS patients had lower preoperative Lund-Kennedy ($p < 0.001$), Lund-Mackay, and SNOT-22 scores ($p = 0.014$, 0.013). Septal abnormalities occurred in 63% of SSS, most often deviating toward the side of orbital floor displacement ($p<0.001$). Mean orbital depression was 3.12mm, which inversely correlated with eye pain ($p = 0.017$) but did not correlate with other preoperative symptoms assessed, including diplopia, enophthalmos, headache, photophobia, blurry vision, or the number of these symptoms present.

Conclusion:
SSS is characterized by a distinct histopathological profile that contrasts with CRSwNP and CRSsNP. These findings underscore the unique pathophysiology of SSS, supporting the need for tailored diagnostic and management distinct from standard chronic rhinosinusitis care.

Poster# ARS074

Incidence and mortality trends: HPV-associated and HPV-independent sinonasal squamous cell carcinoma

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Background:
Human papilloma virus (HPV)-associated, and HPV-independent sinonasal squamous cell carcinoma (SNSCC) differ in pathogenesis, histology, and prognosis. Prior literature reports increasing incidence and stable mortality for HPV-associated SNSCC based on anatomic surrogacy for HPV status. However, histologic pattern represents an alternative framework for HPV status. Furthermore, incidence and mortality trends across different age groups remain poorly characterized.

Methods
Retrospective cohort study using the Surveillance, Epidemiology, and End Results database (2000 to 2022). HPV status was classified by histologic pattern and anatomic subsite. Cohorts were subdivided by age: young (<45), middle-aged (45-64), and older (≥65). Joinpoint regression analysis was used to generate incidence and mortality trends.

Results:
Both classification schemas demonstrated rising HPV-associated SNSCC incidence in middle-aged patients (histologic annual percent change [APC] 5.23, 95% CI 4.14-6.44; anatomic 2017-2022 APC 3.85, 95% CI 0.64-12.58). Incidence also increased in older patients (histology APC 2.43, 95% CI 1.29-3.81). Mortality rates steadily increased for both HPV-associated (2004-2022 APC 2.59, 95% CI 0.45-4.65) and HPV-independent SNSCC (APC 6.08, 95% CI 4.56-8.40) classified histologically in older patients. Anatomic classification showed stable mortality across subtypes.

Conclusions:
HPV-associated SNSCC incidence is rising in middle-aged populations regardless of classification method. Classification by histology suggests increasing mortality rates in both SNSCC subtypes amongst older patients. Further research is critical to accurately assess incidence and mortality and identify contributing factors.

Poster# ARS075

Intraoperative confocal endomicroscopy in endonasal skull base surgery

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Introduction:
Confocal laser endomicroscopy (CLE) enables real-time, cellular-level tissue visualization and has been successfully applied in open neurosurgical tumor resections. Its application in endonasal skull base surgery represents a novel extension that may enhance intraoperative diagnostic accuracy in confined, minimally invasive corridors. This study evaluates the feasibility and diagnostic concordance of CLE imaging during endonasal resection or biopsy of intracranial lesions.

Methods:
In a prospective exploratory trial, 10 adult patients undergoing endonasal resection or biopsy of various skull base tumors including meningiomas and pituitary adenomas underwent intraoperative CLE imaging using the Zeiss CONVIVO system. Sodium fluorescein was administered to enhance image contrast. CLE images were acquired at regions of interest, including tumor margins, and interpreted by a neuropathologist. No intraoperative surgical decisions were made based on CLE findings. The primary endpoint was concordance between CLE imaging and final histopathologic diagnosis.

Results:
CLE demonstrated a 95% concordance rate with final histopathology. The system provided high-resolution cellular imaging of biopsied tissue and enabled visualization of tumor margins beyond resection boundaries. No complications or adverse events related to CLE use were observed.

Conclusion:
CLE is a feasible and safe intraoperative imaging adjunct in endonasal skull base surgery, demonstrating high diagnostic concordance with conventional histopathology. These findings support further investigation of CLE as a real-time adjunct for enhancing diagnostic accuracy and surgical precision in minimally invasive neurosurgical procedures.

Poster# ARS076

Irradiation vs. MMC for optimizing fibroblast support in human nasal epithelial cell culture

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Background:
Human nasal epithelial cell (HNEC) culture is a valuable tool for investigating the upper respiratory system. To generate robust culture models, basal cell expansion of harvested sinonasal mucosa is required. Typical expansion protocols utilize growth-arrested mouse 3T3 fibroblasts as a feeder layer for primary HNECs. However, there is no consensus on the best approach to growth-arrest fibroblasts. In this study, we evaluated fibroblast growth-arrest conditions to enhance HNEC primary cell expansion.

Methods:
Fibroblasts were growth-arrested using irradiation (15-30Gy) or mitomycin-C (MMC) (5-20uL/mg). After treatment, fibroblasts were plated, and growth measured every other day for 7 days. Conditioned media was collected and analyzed using growth factor array. Next, growth-arrested fibroblasts were co-cultured with primary basal HNECs for 7 days and basal expansion was measured by colony size and cell count. Functional activity of differentiated HNEC models under air-liquid interface (ALI) was measured by barrier function (TEER) and cell marker expression.

Results:
Irradiated fibroblasts (20Gy) and MMC fibroblasts (10 and 15 uL/mg) demonstrated comparable growth arrest with healthy morphology after 7 days in culture. Arrested fibroblasts in both conditions produced the same complement of 6 growth factors. Expansion of HNEC basal cells was supported by both conditions, with MMC-treatment demonstrating the greatest growth at 7 days. Differentiated ALI models demonstrated expected barrier function and markers for ciliated, goblet, and olfactory support cells.

Conclusion:
MMC fibroblasts showed greatest resulting epithelial growth. These findings improve parameters to support the development of HNEC in vitro models.

Poster# ARS077

Local biomarkers and smell loss in chronic rhinosinusitis: A systematic review and meta-analysis

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Objective:
To systematically evaluate the local biomarkers correlated with olfactory dysfunction (OD) in chronic rhinosinusitis (CRS).

Study Design:
A systematic review was conducted in CINAHL, Cochrane Library, PubMed, and Scopus from inception to July 2025.

Methods:
Studies on CRS patients and healthy controls who underwent olfactory testing and measurement of biomarkers within olfactory mucus were included. Collected variables included CRS phenotype, olfactory test, mucus protein levels, quantification method, and reported correlation coefficients. Meta-analysis of outcome measures included continuous measures (mean), proportions (%), and correlations (r) with 95% confidence intervals (CI).

Results:
Altogether, 18 prospective studies met criteria, with 4 studies comprising 351 patients eligible for analysis. 53.6% of patients were male, with a mean age of 48.3 years. In CRS (polyp status unspecified), IL2, IL5, IL6, IL9, IL10, IL13, IgE, CCL2, and CCL3 were inversely correlated with OD (r=-0.128 to –0.424; all $p<0.001$). VEGF-A, CXCL5, and CXCL11 were positively correlated with olfaction (r=0.162 to 0.224, all $p<0.02$). Other type 2 cytokines including IL4, IL23, and IL33 did not show any significant correlations. In studies specifying polyp status, CRSwNP displayed similar correlations. In CRSsNP, only IL8 and CXCL5 were weakly correlated with OD (r=-0.183 to 0.274, both $p<0.03$).

Conclusion:
OD in CRSwNP is moderately or mildly associated with specific type 2 cytokines and other biomarkers. No study found a significant correlation between OD and type 2 inflammatory markers in CRSsNP. Further prospective studies are needed to elucidate causal relationships and prognostic utility between local biomarkers and OD.

Poster# ARS078

Long-term sinonasal outcomes in patients with acute invasive fungal sinusitis

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Background:
Treatment advances have improved prognosis for acute invasive fungal sinusitis (AIFS), yet there is limited understanding of long-term sinonasal outcomes in patients that survive the acute setting.

Methods:
A single-institution, retrospective cohort study was conducted to characterize long-term sinonasal outcomes in treated AIFS patients. Patients who were surgically treated for AIFS between 2009-2025 were included. Sinonasal outcomes were characterized by Lund-Kennedy (LK) and SNOT-22 scores. Paired T-tests were used to compare scores between the earliest and latest clinic visits. Univariable and multivariable linear regression models assessed outcome association with clinical and patient factors.

Results:
Of 136 patients diagnosed with AIFS, 40 patients (mean age 56.3±15.2 years, 21 female [52.5%]) met criteria. The mean follow up time was 9.7 months. 7 (17.5%) patients experienced disease relapse, and 4 (10.0%) patients required a subsequent sinus surgery for chronic rhinosinusitis. All-cause mortality rate was 15%. LK scores postoperatively began at 4.08±2.77 (median 1.1 months), and significantly improved at the latest follow up to 1.79±1.47 ($p<0.0001$). SNOT-22 total scores began at 33.5±23.1, and did not significantly improve over time (21.7±25.0, $p = 0.70$). Higher long-term LK scores were associated with PPF dissection ($p=0.02$) and hematologic malignancy ($p=0.004$).

Conclusion:
While postoperative endoscopy scores improve over time, SNOT-22 scores begin at a level of moderate severity and do not improve over time. This discordance suggests a fundamental disruption of sinonasal mucociliary function following surgical treatment in AIFS patients, impacting long-term sinonasal quality of life.

Poster# ARS079

Losing sleep over sinusitis: Objective Fitbit analysis in the all of us program

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Prior studies have established an association between chronic rhinosinusitis (CRS) and sleep disturbances; however, their primary measures were patient reported surveys such as the Epworth Sleepiness Scale and Pittsburgh Sleep Quality Index. Using the NIH All of Us Fitbit database provides an opportunity to evaluate sleep with objective measures.

Participants with a documented CRS diagnosis were included in the CRS cohort, while controls had no CRS history. Individuals with fewer than 7 days of sleep data or with conditions affecting sinonasal function (head and neck cancers, cystic fibrosis, granulomatosis with polyangiitis) were excluded. Demographics and mean total sleep time were compared between cohorts.

The final sample included 3,618 CRS participants and 41,682 controls with 2,459,932 and 25,277,410 sleep days, respectively. Both groups were predominantly white (75.7% vs 69.2%) and female (74.9% vs. 66.4%). CRS participants slept an average of 14.5 minutes less than controls ($p < 0.001$). They also spent less time in deep sleep (58.5 vs. 60 min) and more time in light (257 vs. 255 min) and REM sleep (80.8 vs. 80.4 min) (all $p < 0.001$). Age-stratified analyses showed reduced total sleep across all CRS age groups (18-44, 45-64, >65). The greatest difference was among adults 45-64, who slept 17 minutes less than controls ($p < 0.001$).

Overall, CRS was associated with reduced total sleep duration and time spent in deep sleep, and increased light and REM sleep. Total sleep reduction was consistent across age groups, with the largest impact in those aged 45-64. Further analyses will assess whether sleep differences vary across racial and gender subgroups.

Poster# ARS080

Low-cost 3D-printed rigid nasal endoscope for surgical simulation

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Purpose:
High-fidelity surgical endoscopy training is limited by the high cost and restricted availability of clinical equipment. Affordable 3D-printed alternatives may provide a scalable platform for introducing learners to basic nasal endoscopic skills. We aimed to design a low-cost 3D-printed rigid nasal endoscope and evaluate its educational utility for novice trainees.

Methods:
A 5 mm USB-C rigid borescope was integrated into a custom 3D-printed handle (Fusion360, printed in PLA using Bambu Lab X1-C). Twenty medical students were randomized to a brief hands-on session or an instructional video. All participants obtained an ethmoid region view on a 3D-printed sinonasal model, completed three rounds of a box-trainer task requiring visualization and contact of randomized numbers, and repeated the ethmoid view task. A cost comparison was performed with standard clinical endoscopy systems.

Results:
All participants improved with the 3D-printed scope. Mean box-trainer times decreased 79s from Round 1 to Round 3 ($p<0.001$), and ethmoid view times improved 31s ($p<0.01$). Although hands-on participants initially performed better, performance converged by Round 3 ($p=0.36$), indicating effective endoscopic skill acquisition with repeated use of the scope. Trainees' confidence in using endoscopes doubled after training (1.8 to 3.85/5, $p<0.01$), and mean ratings for realism (3.7/5) and educational value (3.9/5) were high, indicating that our system is both engaging and instructive. The endoscope cost $75, compared with >$15,000 for clinical systems.

Conclusion:
Our 3D-printed rigid nasal endoscope is an effective and accessible tool for teaching foundational endoscopic skills and offers a scalable option for early surgical training.

Poster# ARS081

Management of alar depression

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Introduction:
Depressions of the lower lateral crura can result in significant aesthetic deformities and functional impairment. Lateral crural remodeling offers a versatile approach to recontour the nasal framework, reconstruct the lateral crus, and correct concavity while restoring valve function. This procedure may be performed alone or in combination with reinforcing grafts.

Methods:
This retrospective study included 48 primary rhinoplasty patients, with follow-up ranging from 1 to 11 years. Following transcolumellar and marginal incisions, the skin-soft tissue envelope was elevated in a supraperichondrial plane to expose the lower lateral cartilages and cartilaginous dorsum. The lateral crura were then separated from the underlying mucosa at the posterior surface. Cartilages were released, excised, remodeled, and secured in the desired position. In selected cases, lateral crural grafts or flaps were incorporated to reinforce the reconstruction.

Results:
All patients demonstrated improvement in both nasal form and function, with varying degrees of symptom relief measured by the Nasal Obstruction Symptom Evaluation (NOSE) Scale. Outcomes were comparable between patients treated with and without grafts or flaps. Postoperative edema persisted longer in grafted cases, but no long-term complications were observed. Overall, patients reported high satisfaction with both aesthetic and functional results.

Conclusion:
Lateral crural remodeling provides a reliable and reproducible method for correcting severe concavities of the lower lateral crura. This technique achieves durable functional and aesthetic outcomes without requiring extensive additional tissue, making it a valuable option in functional rhinoplasty.

Poster# ARS082

Management of chronic rhinosinusitis in eosinophilic granulomatosis polyangiitis: A scoping review

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Chronic rhinosinusitis (CRS) is a common and morbid manifestation of eosinophilic granulomatosis with polyangiitis (EGPA). This scoping review summarizes treatment strategies and sinonasal outcomes for CRS with nasal polyps (CRSwNP) and without nasal polyps (CRSsNP) in EGPA. We searched MEDLINE, Embase, CENTRAL, CINAHL, and Web of Science from inception to June 4, 2025, for studies reporting CRS in EGPA. Non-English studies without translation and articles without primary data were excluded. Outcomes included treatment, remission and recurrence, and quality of life measures. 109 studies comprising 1087 patients were included. Median age was 53 years (n=154) and 48% (n=390) were male. CRSwNP was more common than CRSsNP (69% vs 31%). Endoscopic sinus surgery (ESS) was reported in 87% (n=64) and always combined with medical therapy. Systemic regimens in all patients included steroids (91%), immunosuppressants (87%), and biologics (59%), primarily mepolizumab (73%), benralizumab (12%) and dupilumab (23%). CRS remission occurred in 68% of medically treated patients (n=156). In mepolizumab-treated patients (n=113), 89% (n=27) achieved CRS remission, with mean SNOT-22 reductions of 48.3 points (n=10) with medical therapy alone, and 64 points (n=2) with ESS plus medical therapy. In a dupilumab subgroup (n=28), 83% (n=6) achieved remission, with a 25.2-point mean SNOT-22 improvement (n=9), and eosinophilia occurred in 68% (n=28). In conclusion, management of CRS in EGPA is shifting toward biologics, particularly mepolizumab and benralizumab for systemic control and cautionary use of dupilumab for refractory sinonasal disease. Standardized outcome reporting and prospective studies are needed to optimize management.

Poster# ARS083

Measures of efficiency in FESS simulation training

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Objective:
To evaluate the relationship between efficiency metrics and blinded technical skills scores during simulated endoscopic sinus surgery across resident experience levels.

Methods:
Otolaryngology residents performed a standardized unilateral FESS on a 3D-printed, navigated simulator. Objective Structured Assessment of Technical Skills (OSATS) and efficiency metrics (time, idle time, steps completed, maneuver rate) were collected. Non-parametric analysis was employed to evaluate associations between efficiency metrics, prior surgical experience, and resident seniority.

Results:
Fifteen residents participated in the simulation training. Global OSATS scores were moderate (means 2.23–2.43/5) with good inter-rater reliability (ICC 0.68–0.82). Prior FESS experience varied widely (0–80 cases) across the cohort. In the simulation, participants progressed through a mean of 3.33 out of 6 total steps (SD 1.95; median 4), with at least half of the cohort completing sphenoidotomy. Case duration was capped at thirty minutes, with 80% reaching the time limit (mean 26:52, SD 5:50). Senior residents demonstrated shorter case durations ($p = 0.006$) and fewer idle events ($p = 0.002$) than junior trainees. Maneuver rate averaged 4.46/min (SD 1.52), was higher in senior residents ($p = 0.018$), and demonstrated continuous, positive associations with both prior sinus experience ($\rho = 0.71$, $p = 0.0028$) and OSATS performance ($\rho = 0.80$, $p = 0.0003$).

Conclusion:
Efficiency metrics captured meaningful performance variation in simulated endoscopic sinus surgery and aligned with technical skill and experience, supporting their use in tracking resident progression and informing future efficiency-based assessment strategies in FESS training.

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Poster# ARS084

Measuring parameters for endoscopic repair of the skull base with ALT free flap

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Background:
The Nasoseptal flap is the dominant technique for endoscopic repair of the skull base. Large defects or those with poorly vascularized tissue require more robust repair. The anterolateral thigh (ALT) free flap has recently been described as an effective reconstructive option for these cases. Study is needed to determine the optimal length of the pedicle and muscle. We aimed to measure skull base parameters to optimize muscle and pedicle harvest for endoscopic inset of ALT free flaps for large posterior fossa defects.

Methods:
50 head or brain CT scans from patients without skull base pathology were analyzed (30 female, 20 male). Measurements were taken in axial view from anterior wall of maxillary sinus to mid-clivus, width of the sphenoid at the level of the paraclival carotid, lower clivus from one hypoglossal canal to the other, and in sagittal view from planum sphenoidale to foramen magnum, and anterior wall of maxillary sinus to anterior border of the submandibular gland.

Results:
The anterior wall of the maxillary sinus to mid-clivus averaged 77.29 mm (SD 5.39 mm), width of the sphenoid at the level of paraclival carotid 28.43 mm (SD 2.96 mm), lower clivus from one hypoglossal canal to the other 34.21 mm (SD 2.77 mm), planum sphenoidale to foramen magnum 58.79 mm (SD 3.40 mm), and anterior wall of maxillary sinus to submandibular gland 88.69 mm (SD 2.74 mm).

Conclusions:
Knowledge of anatomical relationships between important landmarks in the skull base is needed to better understand the muscle and pedicle length for endoscopic inset of ALT flaps. Measurements from maxillary sinus to the mid-clivus and maxillary sinus to submandibular gland suggest that the average pedicle length needed is 16.

Poster# ARS085

Medicaid coverage and utilization of biologics for CRSwNP

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Introduction:
There has been rapid clinical adoption of novel therapies for chronic sinusitis with nasal polyposis (CRSwNP) following recent FDA approvals. However, little is known about utilization among Medicaid beneficiaries, who may suffer from more severe disease and barriers to care. We investigated coverage and uptake of novel CRSwNP therapies among Medicaid beneficiaries.

Methods:
We performed a cross-sectional review of state Medicaid formularies and Preferred Drug Lists in July 2025 to characterize coverage policies for FDA-approved CRSwNP therapies (dupilumab/omalizumab/mepolizumab/EDS-FLU). We determined whether policies granted preference status and imposed requirements for prior authorization or step therapy. We then extracted annual utilization for each drug between 2015-2024 from the Medicaid State Drug Utilization database. We normalized utilization to annual Medicaid enrollment to account for increases in program size.

Results:
Nearly all states (n=43 of 47 eligible; 91.4%) preferred omalizumab. Approximately half preferred dupilumab (n=28/47; 59.5%) or mepolizumab (n=19/47, 40.4%). Most states required prior authorization or step therapy for coverage, regardless of preference status. Between 2015-2024, drug utilization increased per beneficiary (relative difference: 169.1%) and overall (relative difference: 220.8%); omalizumab accounted for 74.4% of prescriptions in 2024.

Conclusions:
Nearly all state Medicaid programs granted preferred status to omalizumab, which was the most commonly prescribed drug. Given recent head-to-head trial data demonstrating the superiority of dupilumab over omalizumab, Medicaid coverage policies reflect an implicit tradeoff between fiscal sustainability and clinical effectiveness.

Poster# ARS086

Medical and surgical management patterns in patients with idiopathic intracranial hypertension

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Introduction:
This study aimed to characterize the medical and surgical management of IIH, with stratification of patients based on prior history of CSF leak repair.

Methods:
We conducted a retrospective analysis using the TriNetX platform of patients with IIH and IIH with a history of endoscopic anterior skull base CSF leak repair. Primary 5-year outcomes included rates of CSF leak repair, recurrent CSF leak, shunt placement, GLP-1 receptor agonist prescriptions, bariatric surgery, acetazolamide use, topiramate use, and venous sinus stenting (VSS). Analysis was performed from November 2014 to November 2025.

Results:
The IIH cohort included 128,088 patients with a mean age of 37.5 ± 17.1 years, of whom 80% were female. Four percent had a documented CSF leak, and 0.15% underwent endoscopic CSF leak repair. CSF shunt placement occurred in 3% of patients, while VSS was performed in 1%. Medical therapy included topiramate in 17% and acetazolamide in 30%. Weight-management interventions consisted of bariatric surgery in 0.6% and GLP-1 receptor agonist therapy in 7% with 50% of the cohort having documented obesity. Among the 390 IIH patients with a prior endoscopic CSF leak repair, the revision repair rate was 5.4%, shunt placement occurred in 7.7%, GLP-1 receptor agonists were prescribed in 11%, acetazolamide in 50%, topiramate in 16%, and VSS in 3%.

Conclusion:
Newer surgical treatments such as VSS and weight-loss management interventions such as bariatric surgery and GLP-1 receptor agonists appear underutilized. CSF leaks in IIH patients are uncommon and associated with high success rates of surgical repair. These findings highlight the need to better integrate contemporary strategies into the care of patients with IIH.

Poster# ARS087

Modern approaches to septal perforation repair: Endoscopic trends and evolving materials

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Background:
Nasal septal perforation (NSP) repair has traditionally been challenging, but advances over the past five years—especially in endoscopic techniques and graft materials—have improved functional and patient-reported outcomes. Current trends favor minimally invasive approaches that still provide durable structural support.

Methods:
Sixteen studies published from 2020–2025 were reviewed, focusing on operative strategies for NSP repair. Approaches included endoscopic vascularized flaps such as the anterior ethmoidal artery flap, biologic grafts like temporoparietal fascia (TPF) and polydioxanone (PDS), multilayer methods, and newer synthetic materials.

Results:
Endoscopic vascularized flap use has increased, with the tunnel-style anterior ethmoidal artery flap achieving closure rates above 85% for moderate perforations. TPF–PDS constructs showed strong durability and low complication rates in multi-center data. Difficult or revision cases often used silicone films, polycaprolactone sheets, or cadaveric rib cartilage to replace missing tissue. Concurrent perforation repair and rhinoplasty—particularly with bone-cartilage unit grafts—demonstrated functional and cosmetic benefits. For smaller symptomatic perforations, less invasive options such as septal buttons or limited reconstruction provided symptom relief without full closure.

Conclusion:
Recent NSP management trends emphasize vascularized flaps, layered grafting, and tailoring techniques to perforation size and complexity. While outcomes are improving, additional research is needed to determine optimal long-term combinations of materials and methods.

Poster# ARS088

Nasal airway obstruction repair and mental health

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Introduction:
Nasal airway obstruction (NAO) is not only associated with upper airway symptoms but also with systemic effects, including greater anxiety and depression. This study evaluates whether surgical corrections like septoplasty and inferior turbinate reduction affect the prevalence of mood disorders.

Methods:
TriNetX was queried on November 23, 2025, with no date restrictions. Cohort 1 included patients with NAO who underwent septal repair or turbinate reduction (n = 212,753). Cohort 2 included those with NAO who did not undergo either procedure (n = 2,517,532). Single-variable logistic regression models were used to compare propensity matched cohorts based on demographics (age, sex, race), airway disease (chronic rhinitis, chronic sinusitis, chronic obstructive pulmonary disease), depression comorbidities (nicotine dependence, obstructive sleep apnea, insomnia), and fluticasone use.

Results:
In the two propensity matched cohorts, surgical correction with septoplasty and/or turbinate repair was associated with a 27.6% lower relative risk of depression (OR[95% CI] = 0.70[0.68–0.72]), a 32.8% lower relative risk of anxiety (0.64[0.62–0.65]), and a 30.1% lower relative risk of starting antidepressants(0.736[0.720–0.753]). Septoplasty alone and turbinate reduction alone were also associated with reduced diagnoses of depression, anxiety, and antidepressant usage.

Discussion:
These findings support how upper-airway dysfunction and repair is not solely a localized problem but part of a systemic pathway linking breathing, sleep, and mental health. Strengths of this study include adjustment for major contributors to mood symptoms, such as dyssomnia. The main limitation is the inability to characterize quality-of-life.

Poster# ARS089

Nasal and olfactory function in uCLND vs non-cleft NAO

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Introduction:
Nasal airway obstruction (NAO) arises from diverse anatomical abnormalities that can adversely affect nasal and olfactory function. However, the extent of dysfunction in patients with unilateral cleft lip nasal deformities (uCLND) compared with non-uCLND NAO patients remains poorly characterized. This study aims to quantitatively assess the severity of nasal and olfactory dysfunction in these two patient groups.

Methods:
Ten patients with uCLND and 17 patients with NAO, completed the Snap & Sniff Threshold Test (SSTT), anterior rhinomanometry based nasal resistance measurements (NR), the University of Pennsylvania Smell Identification Test (SIT) and the Nasal Obstruction Symptom Evaluation (NOSE). SSTT and NR were assessed unilaterally on the more (MOS) and less (LOS) obstructed sides for non-uCLND NAO, and the cleft (CS) and non-cleft (nCS) sides for uCLND. Median and interquartile range (IQR) were reported, comparisons were analyzed using Wilcoxon rank-sum test, with effect size calculated using rank-biserial correlation.

Results:
NOSE scores were higher for NAO (uCLND: median=60, IQR=29; NAO: median=65, IQR=20; p=0.31, effect size=-0.24). Unilateral NR on the more affected side was higher for uCLND (CS:median=3.845Pa·s/mL, IQR=23.173; MOS: median=2.516Pa·s/mL, IQR=5.248;p=0.09, effect size 0.44). SIT was lower for uCLND (uCLND: median=29, IQR=7; NAO: median=32, IQR=7; p=0.18, effect size=–0.32). SSTT scores were not significantly different between groups (CS vs MOS: p=0.9532, effect size=-0.02; nCS vs LOS: p=0.8894, effect size=-0.04).

Conclusion:
Preliminary findings suggest that while uCLND patients have increased NR and worse smell loss, non-uCLND NAO patients reported more severe perception of NAO.

Poster# ARS090

Nasal deviation incidence rate and growth change in pediatric subjects

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Background:
Nasal septum deviation is one cause of childhood nasal obstruction. However, few studies have evaluated its incidence and growth-related morphological changes. By analyzing CT images obtained for sinus and temporal bone, we assessed developmental changes in nasal septal deviation in a large pediatric population.

Methods:
This retrospective study included patients aged 18 years or younger who underwent sinus or temporal bone CT between 2020 and 2025. On coronal CT images, the angle between the midline and the point of maximum septal deviation was measured. These measured angles were classified into four groups: normal (≤4°), mild (4–9°), moderate (9–15°), and severe (≥15°). In patients who underwent multiple CT examinations across different years, longitudinal changes in deviation angle were analyzed.

Results:
The cohort for this study included 488 subjects: 158 underwent sinus CT and 330 underwent temporal bone CT; 378 (77.4%) had nasal septal deviations classified as more than mild. The incidence of moderate to severe nasal septal deviation was 65% in those aged <3 and 85% in those aged 15-18 years—a significant growth-associated increase.
Analysis of 84 subjects in whom multiple CT scans revealed that the angle of nasal septal deviation increased between the ages of 5 and 16, with the change becoming extremely small after age 17.

Conclusions:
In addition to utilizing sinus CT images, the inclusion of images in temporal bone CT allowed for the analysis of a large number of subjects, including those without nasal symptoms. Nasal structures continue to change morphologically until age 16, suggesting that surgical intervention in patients younger than 16 years may have implications for maxillofacial growth.

Poster# ARS091

Nasal septal splints for epistaxis in hereditary hemorrhagic telangiectasia

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Objective:
To evaluate outcomes in Hereditary Hemorrhagic Telangiectasia (HHT) patients treated with nasal cautery followed by septal splint placement

Methods:
Retrospective chart review of HHT patients with recurrent epistaxis who underwent septal splint placement between 2012-2025 at a single academic center. Demographic data, quality of life metrics, Epistaxis Severity Score (ESS), and patient reported outcomes via prospective survey were collected.

Results:
Fifty-one patients with HHT underwent splint placement following nasal cautery (mean age at treatment 58 years, 55% female). A total of 125 silastic splints were placed intra-operatively, with a mean of 2.4 procedures per patient (SD 2.1). Septal splints with cautery reduced ESS from 6.11 (SD 1.8) to 3.83 (SD 2.3) ($p<.001$). Hemoglobin and hematocrit (H/H) increased from a mean of 11.6 g/dL (SD 2.2) to 12.2 g/dL (SD 2.4) ($p<.001$) and a mean of 36.4% (SD 5.9) to 37.6% (7.4) ($p<.05$), respectively. Splints were placed for a median of 14.6 months [IQR 8-22]. Reasons for removal included side effects (16.1%), dislodgement (38.0%), and return of significant epistaxis (46.0%). Common patient concerns include nasal obstruction, pain, crusting, drainage, foul odor, and congestion. Splint dislodgement occurred with the 0.51mm diameter splint in 50% (n=36) of cases compared to 12% (n=2) of cases using 1.02mm thickness splint ($p<.01$). On prospective follow-up (N=15), patients rated the efficacy of splints in reducing nasal bleeding as 8.3/10, and 80% stated they would use a splint again.

Conclusion:
Septal splint placement following nasal cautery for recurrent epistaxis in HHT patients was well-tolerated and resulted in a significant decrease in ESS and improvement in H/H.

Poster# ARS092

Nasopharyngeal airflow dynamics in patulous eustachian tube

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Introduction:
Patulous eustachian tube (PET) is a challenging disorder producing disturbing symptoms of autophony for voice and breathing. Treatments are typically aimed at altering the Eustachian tube (ET) lumen. However, the benefit is limited as many patients experience recurrent or persisting symptoms. We utilized computational fluid dynamics (CFD) to analyze nasal airflow and its potential role in symptom pathogenesis.

Methods:
Flowgy® (PUC, Spain) was used to perform CFD analysis on CT scans from 4 PET patients and 4 controls (HC) without PET or nasal symptoms. Airflow (AF) velocity (V), pressure (P), and turbulence (T) patterns were analyzed in the ET pharyngeal opening (ETO) and nasopharynx (NP).

Results:
The pattern of AF in the NP differs in PET patients and HC. HC have no trend in the laterality of V, P or T; contrary to PET patients, who have a pattern of lower P, and higher V and T ipsilateral to symptoms.
NP P remained homogeneous in HC, compared to significant pressure differentials on the affected vs the unaffected ETO on PET patients, which all have the lowest NP P area surrounding the symptomatic ETO.
Patient symptoms often improve by closing the ipsilateral nostril. Virtual surgery simulating nostril obstruction was performed on one PET patient to replicate in-clinic maneuvers that temporarily resolve symptoms. The resulting CFD images show NP AF patterns comparable to HC when the ipsilateral nostril is obstructed.

Conclusion:
While PET manifests as an otologic condition, our CFD analysis suggests a rhinologic etiology. This represents a paradigm shift in understanding PET pathophysiology and suggests that therapeutic interventions targeting nasal AF characteristics may offer novel treatment approaches for this challenging condition.

Poster# ARS093

National study of post-EEA complications, interventions, and rising emergency utilization

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Introduction:
Endoscopic endonasal approach (EEA) is the predominant technique for pituitary and sellar lesions with favorable outcomes, yet postoperative complication rates have not been characterized using contemporary large-scale data.

Methods:
Epic Cosmos was used to identify patients who underwent EEA (CPT code 62165) between January 2018-2025. Postoperative complications (CSF leak, epistaxis, meningitis, and related surgical interventions) were evaluated at 1-24 weeks. Thirty-day unplanned readmissions and emergency department (ED) encounters were also assessed.

Results:
A total of 18,008 patients were included. Complications were most common in the early post-operative period. CSF leaks occurred in 0.84% at 1 week, 2.3% at 1 month, and 3.0% at 16 weeks. Postoperative epistaxis rates were 0.59% at 1 week, 1.5% at 2 weeks, and 2.3% at 1 month. Meningitis was rare (0.88% overall), with later onset compared to other complications: 0.1% at 1 week, 0.5% at 1 month, peaking at 0.8% at 2 months. Thirty-day all-cause readmissions were 6.1%. All-cause ED encounters steadily rose from 3.7% at 1 week to 22.7% at 6 months. While complication rates remained stable overall from 2018-2025, ED utilization rose significantly over this period (20.6% vs. 25.1%, $p<0.001$).

Conclusion:
In this large multi-institutional database, most postoperative complications after EEA occurred within 2 months, with CSF leak and epistaxis as the common and early adverse events. ED utilization increased despite stable complication rates, suggesting evolving patterns of health care. These findings support focused early postoperative monitoring and warrant further investigations into systemic or patient-level factors driving increased ED visits after EEA.

Poster# ARS094

National trends in spontaneous cerebrospinal fluid leaks

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Background:
Spontaneous cerebrospinal fluid (sCSF) leaks can present as leakage of clear fluid into the nasal cavity, middle ear, or external auditory canal in the absence of trauma. sCSF leaks have been shown to be correlated with conditions like obesity, obstructive sleep apnea (OSA), and idiopathic intracranial hypertension (IIH). With the well-established national increase in obesity, OSA, and IIH, we hypothesized that the prevalence of sCSF leaks has also increased in the last 20 years.

Methods:
The Nationwide Inpatient Sample (NIS) database was queried for years 2006 -2019 with ICD-9 and ICD-10 codes corresponding to a diagnosis of CSF leak. The NIS approximates a 20% sample of U.S. community hospitals. Patient demographics and pertinent comorbid conditions were also queried. Weighted sample estimates were calculated using the Taylor expansion method. Correlational testing was performed using the chi-square test and ANOVA for age.

Results:
The total unweighted and weighted frequencies of sCSF leaks were 7436 and 36635, respectively. The weighted frequency of sCSF leaks in 2006 was 1301 and 5425 in 2019, a 4.17x increase. The weighted mean age, percent female, and percent white was 47.6 years, 61.6%, and 66.2%. Obesity ($p<0.0001$), OSA ($p<0.0001$), and IIH ($p<0.0001$) were shown to be positively correlated with CSF leak. Sex and diabetes were not correlated with sCSF leaks in our dataset ($p = 0.085$ and 0.062).

Conclusion:
Our study has shown an increase in the prevalence of spontaneous CSF leaks from 2006 – 2019. This was positively correlated with obesity, OSA, and IIH. Future studies are needed to examine the relationship between pediatric obesity and sCSF leaks.

Poster# ARS095

Neutralizing antibodies in allergy biologics

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Introduction:
Neutralizing anti-drug antibodies (nAbs) remain an under-recognized aspect of biologic therapy in type 2 inflammatory disease. Although most anti-drug antibodies (ADAs) are clinically silent, nAbs may reduce drug exposure, blunt treatment response, or rarely contribute to hypersensitivity. Because immunogenicity reporting is inconsistent and assay methods vary across trials, the true prevalence and clinical relevance of nAbs among allergy-indicated biologics remains uncertain.

Methods:
We reviewed 23 randomized controlled trials (RCTs) of four allergy-indicated biologics—dupilumab, omalizumab, mepolizumab, and tezepelumab—in adolescents (≥12 y) and adults. ADA/nAb data were extracted only from trials or regulatory documents reporting validated assay-based incidence. Findings were summarized descriptively given heterogeneity in assay methods, sampling frequency, and reporting thresholds.

Results:
ADA incidence ranged from 0–6% for mepolizumab and tezepelumab and 0% for omalizumab. Dupilumab demonstrated higher ADA rates (up to 8–16% across age groups) but nAbs remained uncommon (≤5%) and high-titer nAbs rare (<1%). When present, dupilumab nAbs were typically transient and only rarely associated with reduced drug levels or brief attenuation of response; overall efficacy and safety remained comparable between ADA-positive and ADA-negative patients. For mepolizumab and tezepelumab, low-titer ADAs did not measurably affect pharmacokinetics, pharmacodynamics, or clinical outcomes.

Conclusions:
Most ADAs are low-titer and clinically silent; however, recognizing drug-specific nAb patterns may help contextualize unexpected loss of biologic effect and guide rational monitoring.

Poster# ARS096

Odor familiarity and recognition

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Background:
Odor recognition memory is understudied despite its potential to distinguish neurodegenerative-related olfactory deficits from normal aging. We evaluated performance on a novel odor recognition memory task (ORMT) and examined how subjective familiarity influences odor encoding and recall.

Methods:
Adults with confirmed olfactory and cognitive features (n=72) completed the ORMT, consisting of an encoding phase that involved rating the familiarity of ten common odors, followed by delayed recognition. Internal reliability, item-level hit and false-alarm rates, and the association between psychosocial ratings and recognition performance were assessed.

Results:
Participants performed well overall (mean recognition memory score: 14.69/20.00, SD=2.10), with high true-positive rates and variable false-positive rates across distractors. Subjective familiarity strongly predicted recognition: odors rated familiar during encoding were recognized more accurately than unfamiliar odors (median hit rate 0.87 vs. 0.75, z=-2.74, p=0.006). In contrast, population-level familiarity norms did not correlate with performance. Recognition was not significantly associated with odor intensity or pleasantness. Internal reliability was low (Cronbach's α = 0.27), likely reflecting heterogeneity in familiarity across items.

Conclusion:
Despite the limited reliability of the current odor set, our findings indicate that individual-level subjective familiarity is a key determinant of odor recognition memory performance. Incorporating personalized familiarity modeling may improve future OMRT design. Ongoing work in larger cohorts, specifically with individuals at risk for or diagnosed with Alzheimer's disease, will clarify its clinical utility.

Poster# ARS097

Olfactory loss duration impacts health optimism, self-efficacy, literacy, and symptom burden

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Background:
Olfactory loss (OL) impairs well-being and quality-of-life. Psychological factors such as health perception, mindset, and self-efficacy may influence health outcomes but are unexplored in OL. This study characterized these psychosocial features and symptom burden at varying OL durations.

Methods:
Adults at a tertiary rhinology clinic with a primary complaint of OL completed UPSIT, SNOT-22, Health Mindset Scale (HMS), Life Orientation Test–Revised (LOT-R), Perceived Health Competence Scale (PHCS), and Brief Health Literacy Screen (BHLS). Groups were compared with Kruskal-Wallis, pairwise Wilcoxon, and Welch's t-tests.

Results:
Thirty-three patients (15M:18F; mean age 52.9 years) were included. Mean scores were 16.2 ± 4.6 (LOT-R), 14.5 ± 2.3 (HMS), 13.1 ± 2.9 (PCHS), and 13.1 ± 2.9 (BHLS). Etiologies included CRS (n=14), post-viral (n=8), and idiopathic (n=7). Patients with OL <3 months reported significantly lower SNOT-22 smell symptom burden (2.8) than those with 3–12 months (4.3, p=0.03) or >12 months (3.9, p=0.03). Non-significant but consistent trends in psychosocial measures across duration groups (<3, 3-12, >12 months) were observed: patients with OL <3 months demonstrated more favorable LOT-R (19.3, 14.9, 16.0), PHCS (15.0, 13.0, 13.1), and BHLS (15.0, 12.1, 12.7) scores, while longer duration groups appeared similar.

Conclusion:
Short-duration OL (<3 months) was associated with lower symptom burden and more favorable health optimism, self-efficacy, and literacy scores. Differences in health perceptions and coping responses at varied OL durations may help identify opportunities for psychosocial support.

Poster# ARS098

Olfactory outcomes after planum meningioma resection

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Introduction:
Planum sphenoidale meningiomas are rare benign tumors often resected via endonasal approach. While there is literature describing olfactory outcomes after resection of other anterior cranial fossa tumors, there is a lack of data describing outcomes for these planum tumors, making preoperative counseling challenging.

Methods:
We identified patients at our institution undergoing endoscopic endonasal resection of planum sphenoidale meningiomas from 2012 to present. Demographic and clinical data was collected via chart review. SNOT-22 score specific to the smell and taste loss question was collected pre- and postoperatively at 3-6 month and 1 year time periods. Univariate and multivariate analysis was done to identify predictors of postoperative smell and taste scores.

Results:
54 patients were identified, 82% (n=46) female and with median age of 59 years. Only 5 (9%) patients had concurrent chronic rhinosinusitis, and 6 (11%) were undergoing revision surgery.

At 3-6 months postoperatively, half of patients reported intact smell and taste (scores 0-1), 19% had mild issues (scores 2-3), and 30% reported significant issues (scores 4-5). Scores were again similar at the 1-year mark. In univariate and multivariate regression, the degree of tumor extension above the planum was not associated with worse smell and taste outcome ($p > 0.05$). Former or active smoking and non-Caucasian race were associated with worse smell and taste scores ($p= 0.001$ and 0.03, respectively).

Conclusion:
Patients with sphenoidale meningiomas separated into three groups postoperatively in terms of smell and taste outcomes, with about half with minimal changes after surgery and 30-35% with significant issues even at a year after surgery.

Poster# ARS099

WITHDRAWN

Poster# ARS100

Patient-reported experiences of empty nose syndrome: A thematic analysis of online forum posts

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Background:
Empty Nose Syndrome (ENS) is a rare condition marked by paradoxical nasal obstruction and reduced airflow sensation. Poorly understood and often dismissed, ENS leaves many patients seeking support online. This study analyzes Reddit posts to explore key themes and emotional tone in ENS narratives.

Methods:
A total of 364 posts from the r/emptynosesyndrome subreddit (Jan 1, 2024–Jan 1, 2025) met inclusion criteria. Posts were coded for five themes (symptom descriptions, emotional distress, medical dismissal, surgical regret, and coping strategies) using pattern-based analysis. Two independent reviewers manually classified each post as positive, neutral, or negative.

Results:
Surgical regret was the most common theme (160 posts, 44%), with many patients expressing frustration that the risk of ENS was not disclosed prior to surgery. Emotional distress appeared in 101 posts (28%), referencing anxiety, depression, or suicidality. Medical dismissal was noted in 18 posts (5%), often describing misdiagnosis or invalidation. Nineteen posts (5%) mentioned alcohol or illicit drug use for coping. Reviewer 1 labeled 11% of posts as positive, 37% as negative, and 52% as neutral, while Reviewer 2 labeled 11%, 36%, and 52%, respectively. Interrater agreement was high, with a Cohen's kappa of 0.82.

Conclusion:
Although rare, ENS can cause debilitating symptoms in affected patients. Their distress is often worsened by diagnostic ambiguity and perceived dismissal in the healthcare system. This is the first study to analyze online narratives from ENS patients, offering insight into their experiences and frustrations. These findings may help clinicians better understand patients' concerns, unmet needs, and priorities for improving care.

Poster# ARS101

Patterns of metastasis and survival across 20 sinonasal malignancies

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Introduction:
Sinonasal malignancies (SNM) are histologically diverse tumors with variable metastatic behavior and prognosis. Their rarity has limited direct comparisons, leaving clinicians without unified data to contextualize divergent biological behaviors, define histology-specific vulnerabilities, and guide risk-adapted management.

Methods:
We analyzed 32,851 SNM cases from 2004–2022 in the National Cancer Database, assessing primary site distribution, regional and distant metastasis (RM/DM) rates, metastatic tropism, and overall survival (OS). Median OS and Cox hazard models quantified impacts on survival.

Results:
Lymphoepithelial carcinoma (51%), rhabdomyosarcoma (RMS, 50%), and NUT carcinoma (35%) had the highest RM rates. RMS (27%), mucosal melanoma (MM, 16%), and SNEC (13%) were most prone to DM. Metastatic patterns were histology-specific: RMS and NUT carcinoma showed strong bone tropism, whereas SNUC disseminated broadly across lung, bone, brain, and liver. Survival varied widely by histology and RM/DM status. Non-metastatic olfactory neuroblastoma showed favorable prognosis (median OS >150 months) that declined sharply with RM or DM (69 or 27 months). NUT, MM, and giant & spindle cell carcinoma displayed the worst prognoses, with respective median OS 15, 26, and 30 months. RM and DM significantly worsened survival across nearly all histologies, with DM exerting the greatest effect.

Conclusions:
SNM display marked heterogeneity in metastatic behavior and survival. This large, unified comparison across 20 histologies reveals distinctions unrecognized in isolated studies and provides a comprehensive reference to guide risk assessment, clinical management, and future mechanistic and therapeutic studies targeting SNM.

Poster# ARS102

Physical activity improvements after sinus surgery: A multi-center wearable technology pilot study

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Introduction:
Chronic rhinosinusitis (CRS) has been consistently associated with reduced quality of life, including limitations in mobility and daily activities. Wearable technology has demonstrated utility in tracking physical activity after surgical interventions, though no studies have published real-world data on activity levels after sinus surgery.

Methods:
We performed a retrospective review of Apple Health data from patients diagnosed with CRS who underwent sinus surgery at tertiary academic centers. Data were extracted for two timepoints: 1–3 months preoperatively and 3–6 months postoperatively. Metrics analyzed included average monthly steps, active calories burned, and distance walked or run. Paired t-tests were conducted to compare pre- and post-surgical means ± standard deviations for each metric.

Results:
Among 14 CRS patients (mean age=33), average monthly steps increased from 7,705.5 ± 4,582.5 preoperatively to 8,453.1 ± 5,244.5 at 3–6 months post-sinus surgery ($p = 0.007$). Average monthly active energy burned significantly increased from 231.5 ± 178.4 kcal preoperatively to 285.2 ± 202.4 kcal post-procedure ($p = 0.006$). Average distance walked or run increased from 3.51 ± 2.12 mi preoperatively to 3.79 ± 2.29 mi postoperatively ($p = 0.006$). SNOT-22 scores post-surgery trended similarly to activity levels (39.3 ± 25.1 vs. 18.2 ± 12.4, $p=0.06$).

Conclusion:
Using real-world data, we observed CRS patients post-sinus surgery to have significant improvements in activity metrics as measured by wearable technology. This pilot study suggests that postoperative recovery extends beyond symptom relief to include enhanced physical performance. Data collection is ongoing to further explore these findings.

Poster# ARS103

WITHDRAWN

Poster# ARS104

PM2.5 vs. PM10 impact in CRS

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Background:
Both PM2.5 and PM10 particulate matter (PM) exposure have been linked to higher CRS incidence, severity, and healthcare utilization. We performed a scoping review to compare PM2.5 and PM10 effects on CRS.

Methods:
Following PRISMA-ScR, we searched MEDLINE, Embase, Scopus, and Web of Science (English, 2010–2025) for CRS studies reporting ambient PM2.5 and/or PM10 with clinical or utilization outcomes. Records were dual-screened in Covidence, adjusted effects harmonized to per–10 μg/m³, and random-effects models used when ≥2 comparable estimates were available.

Results:
14 studies met criteria: 2 time-series analyses, 11 clinical cohorts, and 1 case–control. Exposure metrics and endpoints varied. PM exposure was assigned using monitors, land-use or hybrid models, census-based surfaces, or satellites. Exposure windows varied from weeks to multi-year means. Outcome endpoints included SNOT-22, Lund–Mackay score, histopathology, nasal microbiome, diagnosis odds, and visit counts. Of these, only visit frequency had ≥2 adjusted effects per 10 μg/m³: PM2.5 %Δ 59.4 (95% CI −37.0 to 303.7; I^2 97.4%) and PM10 %Δ 15.6 (95% CI −13.2 to 54.0; I^2 97.1%). Across non-utilization endpoints, higher PM2.5 more consistently aligned with worse symptoms, attenuated SNOT-22 improvement after surgery, and higher tissue cytokines and eosinophils than PM10. Lund–Mackay scores and microbiome findings were inconsistent.

Conclusions:
PM2.5 shows some associations with symptom burden, postoperative recovery, and tissue inflammation compared with PM10.Pooled visit-frequency estimates for both PM2.5 and PM10 were not dissimilar. Standardized exposure windows and common outcome scales are needed to enable robust studies of PM exposure in CRS.

Poster# ARS105

Pollutant exposure and Lund-Mackay score

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Background:
Ambient air toxicants have been implicated in chronic airway inflammation, but their contribution to chronic sinusitis (CRS) progression remains unclear. We evaluated associations between pollutant exposure using objective residential data and CRS severity via the Lund-Mackay (LM) scoring system.

Methods:
We conducted a retrospective review of patients presenting for rhinology evaluation with sinus CT imaging between 2018-2022. Residential ZIP codes of patients meeting CRS diagnostic criteria were linked to modeled concentrations of six airborne pollutants from the California Air Toxics Assessments dataset. Exposure was classified as severe if the ZIP-code pollutant level exceeded the median of all counties. The primary outcome was elevated LM score, defined as the top 20% (>13). Multivariable ordinal regression assessed associations between severe pollutant exposure and high LM score, controlling for demographic factors, smoking status, hypertension, year of surgery, and LA County residence. Model assumptions were satisfied.

Results:
In adjusted models of 1,172 patients with CRS (median age 54, 46% female), patients with severe exposure (top 20%) to benzene (OR[95% CI] = 1.55[1.13–2.14]), butadiene (OR[95% CI] = 1.69[1.24-2.31]), lead (OR[95% CI] = 1.44[1.06-1.96]), chromium (OR[95% CI] = 1.54[1.13-2.11]), and nickel (OR[95% CI] = 1.54[1.13–2.10]) had significantly higher odds of elevated LM scores compared to patients with non-severe exposure. Zinc exposure showed no significant association with LM score.

Conclusion:
Multiple airborne pollutants were independently associated with radiologic CRS burden, suggesting environmental exposure may be an under-recognized and modifiable risk factor.

Poster# ARS106

Postoperative dapsone therapy in rhinosporidiosis

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Background:
Rhinosporidiosis is a chronic inflammatory disease frequently occurring in Asia. Surgery is the mainstay of treatment. About 48% of postoperative patients experience recurrence. To prevent recurrence, dapsone is now recommended. Our study aims to determine the extent to which dapsone therapy prevents recurrence from our perspective.

Methods:
A survey of 101 patients in the two tertiary care hospitals, Comilla Medical College Hospital and Comilla Medical Centre PVT LTD, Cumilla, Bangladesh, from July 1, 2016, to June 30, 2022. Here, 64 patients were treated with dapsone (Cases, n=64), and 37 patients were observed without dapsone therapy (Controls, n=37).

Results:
Males (81.2%) suffer more than females (18.8%). The age group with the highest prevalence was 5-14 years (38.6%), followed by 15-24 years (28.7%). Rural areas (85.1%) and poor households (70.3%) had the highest prevalence. 26.7% were recurrent cases; postoperative dapsone was 63.4%, and 36.6% were not receiving dapsone. Recurrence without dapsone was 43.2%, and with dapsone, 4.7%. The binary logistic regression was performed in SPSS to estimate the odds ratio. The adjusted 95% C.I. for the odds ratio or Exp(B) of two groups in different variables. Age=1.101, 1.004-1.208, P=.041, Sex=.248, .044=1.389, P=.113, Residential status=.202, .013-3.041, P=.247, Number of operations= .036, .001-.989, P=.049, Treatment with dapsone= 195.754, 12.477=3071.263, P=<.001, Follow-up time in months 1.085, 1.036-1.136, P <.001.

Conclusion:
A positive cure trend was observed for age, treatment, and follow-up in postoperative dapsone therapy for rhinosporidiosis, and a negative trend was observed for sex, residential status, and number of operations.

Poster# ARS107

Practice patterns in the management of rhinitis medicamentosa: A survey of otolaryngologists

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Introduction:
Rhinitis medicamentosa (RM) is caused by chronic use of nasal decongestants. This study surveyed otolaryngologists to identify practice patterns regarding management given that strong evidence-based recommendations do not exist.

Methods:
Members of the American Rhinologic Society (ARS) and the Federación Mexicana de Otorrinolaringología y Cirugía de Cabeza y Cuello (FESORMEX) responded to a survey regarding practice demographics and medical and surgical practice patterns for RM. Our main outcome was the number of otolaryngologists who offered surgery for RM. Other outcomes included preferences for adjunct medications and decongestant weaning. Logistic regression estimated the association of potential predictors with RM surgery response which were expressed in crude and adjusted odds ratios (aORs) and 95% confidence intervals (CIs).

Results:
The survey was completed by 200 otolaryngologists (100 FESORMEX, 100 ARS). The most common specialty was rhinology (46.0%). A plurality had 0-10 years in practice (47.0%). Most (74%) respondents only offered surgery to medically refractory RM patients, with 23.0% never offering and 3.0% offering it upfront for new patients. Generalists had significantly lower odds of offering surgery compared to rhinologists (aOR = 0.33, 95% CI 0.14 – 0.82). Years in practice and professional organization were not associated with offering RM surgery. Nasal steroids were the most common adjunct medication (97%) followed by nasal saline (78%) and oral steroids (75%).

Conclusion:
Practice patterns varied among responders, but common trends included offering surgery to medically refractory RM patients, as well as choice of medication adjuncts. Rhinologists were more likely to offer surgery.

Poster# ARS108

Predictors of biologic switching in CRSwNP

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Objectives:
Biologic therapies have expanded treatment options for chronic rhinosinusitis with nasal polyps (CRSwNP), yet some patients ultimately require a change in biologic therapy. Identifying reasons for and clinical predictors of biologic switching may inform personalized biologic selection and shorten time to optimal therapy.

Methods:
We retrospectively reviewed adults initiating biologics for CRSwNP between 2009-2025 at a tertiary center. Demographic, clinical, laboratory, radiographic, histopathologic, and Sinonasal Outcome Test-22 (SNOT-22) data were collected. Predictors of subsequent biologic change were analyzed.

Results:
Among 400 patients, 70 (18%) switched biologics after an average of 38 months. All patients had a diagnosis of CRSwNP, which was the primary indication in 61%. Baseline demographics were comparable between groups. Switching was more common with omalizumab (39%) and mepolizumab (40%) than dupilumab (5%, $p<0.01$). Most from omalizumab or mepolizumab transitioned to dupilumab for inadequate CRSwNP control (42% and 50%); dupilumab was typically discontinued for adverse effects (39%). Compared with those maintaining initial therapy, switchers exhibited greater eosinophilia ($p=0.03$), fungal elements ($p=0.02$), radiologic air-fluid levels ($p<0.01$), asthma ($p<0.01$), AERD ($p=0.01$), and COPD ($p=0.04$). Baseline SNOT-22 scores were similar ($p=0.20$), but higher for switchers at 6 months ($p<0.01$). 59% achieved MCID 6-12 months after switching.

Conclusion:
Most who switch biologics for CRSwNP typically transition to dupilumab due to inadequate symptom control. Biologic switching is associated with more complex inflammatory and comorbid disease. Early recognition of predictors may help optimize biologic selection.

Poster# ARS109

Predictors of odontogenic sinusitis severity

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Introduction:
Odontogenic sinusitis (OS) ranges from isolated maxillary disease to pansinusitis. We compared patient characteristics, microbial and histopathological features, and symptom outcomes following ESS between low and high-radiographic burden OS patients.

Methods:
OS Patients undergoing ESS between 01/2013 and 08/2024 were reviewed. Preoperative CT scans were used to classify patients into high-burden [with ostiomeatal complex (OMC) opacification] and low-burden OS [clear OMC]. Demographic, microbiological, and histopathological data were analyzed. Symptom improvement was assessed using pre- and postoperative SNOT-22 scores.

Results:
Eighty-seven patients were included (high-burden: 70; low-burden: 17). High-burden OS was associated with older age ($p=0.014$), increased overall degree of inflammation ($p=0.002$), hyperplastic/papillary epithelial changes ($p=0.034$), and neutrophil infiltration ($p=0.003$). Classical OS bacteria (Fusobacterium spp., Prevotella spp., mixed anaerobes, Streptococcus anginosus group) did not correlate with disease burden ($p=0.110$). No independent predictors of high-burden disease were identified. Post-ESS, significant reduction in total and rhinologic SNOT-22 scores were only observed in the high-burden OS group ($n=39$; median reductions: 23 and 12 respectively; $p<0.001$).

Conclusions:
Older patients are possibly susceptible to high-burden OS. Radiologic disease severity correlates with tissue level inflammation. Classical OS bacterial profile might not be related to disease severity. While ESS is the preferred treatment for high-burden OS patients, alternative therapeutic options may be considered in low-burden OS to offer improved symptom control and resolution.

Poster# ARS110

Preoperative hypoalbuminemia and 30-day outcomes after functional endoscopic sinus surgery

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Background/Objectives:
Functional endoscopic sinus surgery (FESS) is typically considered elective and low risk. Although rare, surgical complications such as bleeding, infection, and cerebrospinal fluid (CSF) leakage can contribute to postoperative morbidity and mortality. This study analyzes the association between preoperative hypoalbuminemia and adverse 30-day outcomes in patients undergoing FESS.

Methods:
TriNetX, a federated deidentified EHR network, was queried to identify adults who underwent FESS. Patients with serum albumin ≤3.4 g/dL measured within 7 days before surgery were compared with patients with albumin >3.4 g/dL in the same window. After propensity score matching for demographics and comorbidities, 30-day outcomes were analyzed. Associations were reported as odds ratios (OR) with 95% CIs; mortality was evaluated with Kaplan–Meier and Cox models.

Results:
Compared with normal preoperative albumin, greater odds were observed among hypoalbuminemic patients for pneumonia (OR = 2.316 [1.566, 3.428]), venous thromboembolism (OR = 2.192 [1.435-3.349]), sepsis (OR = 2.953 [2.04-4.274]), respiratory dependence (OR = 1.978 [1.059-3.695]), meningitis (OR = 1.701 [1.174-2.466]), and orbital cellulitis (OR = 1.945 [1.495-2.53]). Odds of mortality were also increased (OR = 3.505 [2.791-4.403]; Kaplan–Meier/Cox HR = 3.397). No significant association was found for epistaxis (OR = 1.045 [0.926,1.179]).

Conclusions:
Preoperative hypoalbuminemia was associated with higher 30-day risks of infectious, thromboembolic, respiratory dependence, and mortality outcomes after FESS. Incorporation of preoperative serum albumin into evaluation may aid risk stratification with future prospective validation recommended.

Poster# ARS111

Prognostic outcomes of treatment modalities in esthesioneuroblastoma: Meta-analysis

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Background:
Esthesioneuroblastoma (ENB) is a rare sinonasal malignancy with different consensus on the optimal use of surgery, radiotherapy, and chemotherapy. We aimed to identify current treatment strategies that favor better long-term survival and disease control.

Methods:
PubMed, Embase, Web of Science, and ScienceDirect were searched from January 2000 to October 30, 2025, for studies reporting on the survival and tumor control outcomes of ENB by primary treatment modality. Pooled 2-10-year prognostic estimates were calculated using a random-effects meta-analysis model.

Results:
Out of 1,130 records, 72 studies including 6,890 ENB patients were analyzed. Across all Kadish stages, 5-year OS was highest with surgery plus radiotherapy (Sx + RT; 85.4%), closely followed by induction chemotherapy, surgery, and radiotherapy (CT + Sx + RT; 83.5%). Intermediate OS was seen with surgery plus chemoradiotherapy (Sx + CRT; 73.9%), RT + Sx (73.2%), and surgery alone (Sx-only; 72.6%), while outcomes were not favorable with primary RT alone (44.0%) and CRT alone (28.0%). For 5-year disease-free survival (DFS), the best disease control was achieved with RT + Sx (84.8%), followed by CT + Sx + RT (79.0%) and Sx + RT (73.1%). DFS was lower with Sx + CRT (52.8%), primary RT (41.7%), and Sx-only (37.2%), and lowest with CRT alone (28.8%). In advanced-stage ENB, 5-year OS was highest with Sx + CRT (75.3%), while 5-year DFS was greatest with Sx + RT (55.1%).

Conclusion:
Surgery-based multimodality therapy, especially Sx + RT and CT + Sx + RT, provides the best long-term survival and tumor control in ENB. Across stages, adding RT to surgery improves control, and in advanced ENB, Sx + CRT maximizes OS while Sx + RT offers the best DFS.

Poster# ARS112

Psychiatric events associated with elexacaftor/tezacaftor/ivacaftor use: A pharmacovigilance study

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Introduction:
Elexacaftor/Tezacaftor/Ivacaftor (ETI) has transformed cystic fibrosis care, improving sinonasal quality of life and objective measures of sinus disease. However, a subset of ETI users experience significant psychiatric side effects, raising concerns over its mental health impact. Rates of psychiatric effects of ETI at the population level remain poorly characterized. We aimed to better understand the rate of mental health adverse events in routine clinical use of ETI.

Methods:
The FAERS database was queried with OpenVigil2.1 for "Trikafta" using MedDRA preferred terms for psychiatric symptoms (anxiety, depression, depressed mood, suicidal ideation, and mental disorder). Reports with incomplete data and age <2 years were excluded. Two sex-stratified 2x2 contingency tables were generated and combined for disproportionality analysis.

Results:
The query identified 232 adverse events (AEs) of interest for ETI compared to 197,865 AEs of interest for all other drugs. Among all reported AEs for ETI, the rate of queried psychiatric drug events was 10.5%. Median age was 21 years and 58.6% were female. The proportional reporting ratio was 3.39 (95% CI 2.99;3.82) and the reporting odds ratio was 3.64 (95% CI 3.17;4.15). These values meet criteria for a likely signal defined in OpenVigil2.1 (n>2, $\chi 2$ >4, PRR >2).

Conclusion:
The rate of psychiatric AEs calculated from the FAERS database is higher than the rates reported in controlled clinical trials for ETI, suggesting mental health side effects may be more common in real-world use. Although patient-reported data is often imperfect, these data can serve as a resource for patients and prescribers when considering psychiatric impacts of ETI.

Poster# ARS113

Quality-of-life after endoscopic endonasal pituitary surgery

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Introduction:
Endoscopic endonasal surgery is the standard approach for pituitary adenoma, with lower morbidity and quicker recovery. However, postoperative changes in quality of life(QoL) remain inconsistent. This meta-analysis synthesizes prospective evidence evaluating QoL using validated instruments.

Methods:
A systematic search of PubMed, Embase, and Scopus identified prospective studies reporting pre- and postoperative QoL using the Anterior Skull Base Questionnaire (ASBQ), Sinonasal Outcome Test–22 (SNOT-22), or Short Form–36 (SF-36). Mean changes were extracted for early (≤6 weeks), short-term (3–6 months), and long-term (6–12 months) follow-up. Eighteen studies were included qualitatively and twelve quantitatively. Random-effects models were used, and heterogeneity was assessed with I^2.

Results:
Across studies reporting SNOT-22, early postoperative changes were mixed, while short-term follow-up showed clearer improvement with pooled reductions of ~6–8 points. Heterogeneity was substantial (I^2≈70–80%). By 6–12 months, scores generally stabilized or improved mildly. ASBQ showed small early declines but progressive recovery, with pooled long-term increases of ~0.2–0.3 on the 1–5 scale. Heterogeneity for ASBQ was low to moderate (I^2≈0–40%).

Conclusions:
Endoscopic endonasal pituitary surgery leads to modest but durable QoL improvement. Early sinonasal symptoms typically resolve, and longer-term outcomes across sinonasal and skull-base–specific domains demonstrate clinically meaningful gains. High heterogeneity for SNOT-22 reflects variations in baseline sinonasal status and surgical technique, whereas ASBQ changes were more consistent. Findings support the endonasal approach as a patient-centered standard of care.

Poster# ARS114

Radiology education in otolaryngology residency: Current practices and opportunities

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Introduction:
Radiologic interpretation is essential to otolaryngology practice, especially in rhinology and skull base surgery, yet no standardized ACGME imaging requirements exist. As a result, residency programs vary widely in their approach to radiology education.

Methods:
Current patterns in radiology curricula, program director preferences, timing of dedicated rotations, and resident performance in skull base anatomy identification were reviewed, along with evidence from targeted educational interventions.

Results:
Seventy-one percent of programs report a structured radiology curriculum, most commonly delivered monthly through mixed case-based and lecture formats led by radiologists or combined faculty. Program directors strongly support formal imaging education and prefer monthly case-based review. Dedicated radiology rotations are offered in 56% of programs, most often during PGY-1 following recent ACGME changes; however, directors favor scheduling these rotations later (PGY-2 or PGY-3), suggesting current timing may not optimize learning. Although rhinology is viewed as the strongest-taught subspecialty, residents continue to show significant deficiencies in recognizing key skull base structures—such as the optic canal, superior orbital fissure, and foramen rotundum—on axial CT. Brief, focused anatomy courses have been shown to markedly improve identification of these high-risk landmarks.

Conclusion:
Radiology education in otolaryngology residency remains inconsistent, with clear opportunities for improvement. Emphasizing skull base imaging, aligning rotation timing with educational needs, and expanding structured case-based instruction may enhance resident competency and improve surgical safety.

Poster# ARS115

RAI outperforms mFI-5: Frailty tools predicting postoperative outcomes in rhinologic surgery

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Background:
Frailty is an important predictor of postoperative outcomes in otolaryngology. The Modified Frailty Index-5 (mFI-5) is widely used but limited in granularity, whereas the Risk Analysis Index (RAI) is a more comprehensive tool that has shown strong predictive utility across surgical specialties, but remains understudied in rhinology.

Methods:
A retrospective review of 1068 adult patients who underwent rhinologic surgery was performed between 2023–2025. Frailty was scored using RAI and mFI-5. Outcomes included 30-day postoperative complications, readmissions, emergency department (ED) visits, and discharge disposition. Subgroup analysis compared skull base to non-skull base procedures. Frailty tool predictive performance was evaluated via logistic regression.

Results:
Higher RAI scores were independently associated with increased odds of 30-day readmission ($p=0.003$), ED visits ($p=0.022$), and discharge with home health/skilled nursing ($p=0.013$). MFI-5 predicted readmission ($p=0.008$), home health/skilled nursing ($p=0.0006$), but did not predict ED visits ($p=0.387$). In multivariable models adjusted for age and sex, both RAI and mFI-5 were associated with postoperative complications. Within the skull base surgery subgroup (n=63), only RAI remained predictive of postoperative complications ($p=0.029$), whereas mFI-5 did not ($p=0.183$).

Conclusion:
In this large rhinology cohort, RAI demonstrated superior predictive performance compared to mFI-5, particularly for 30-day ED visits. This trend of superior RAI performance was also identified among patients undergoing skull base surgery with postoperative complications. These findings support incorporating the RAI into preoperative risk assessment for rhinologic surgery.

Poster# ARS116

Real-world sinus rinse practices in CRS

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Introduction:
Nasal saline irrigation is an integral part of chronic rhinosinusitis (CRS) management. However, patient techniques vary substantially, and the impact of this variability on efficacy and safety remains unclear.

Methods:
Adult CRS patients at a tertiary rhinology clinic completed a structured survey (n=50) on their rinse habits, and were video recorded (n=30) performing their rinse technique without coaching. Video analysis quantified squeeze count and rinse duration. Expelled volume was calculated from the change in bottle weight after use, and divided by duration to yield flow rate. Flow rate and nozzle diameter were applied to Poiseuille's law to estimate force and pressure. Head tilt was measured as the chin–brow vertical angle (CBVA) using still frames.

Results:
Survey responses revealed diverse practices: 36% rinsed only when symptomatic, 22% multiple times daily, and 20% daily. Although 64% used distilled water, 14% used tap, with 71% of those not consistently boiling it. Nearly 60% did not routinely replace their bottle. Video analysis showed wide variability: squeeze counts 1-20 (mean 4.5 ± 3.8), rinse duration 5-98 s (mean 19.4 ± 17.8 s), flow rate 2.3-43.3 mL/s (mean 15.9 ± 9.7 mL/s), estimated force 0.0004-0.149 N (mean 0.027 ± 0.034 N), pressure 0.33-119 mbar (mean 21.7 ± 27.1 mbar), and CBVA 42.2-86.2° (mean 63.6° ± 12.2).

Conclusion:
CRS patients demonstrate wide variation in rinse technique and safety practices. Many used unboiled tap water or failed to replace bottles regularly. Technique variability underscores the need to strengthen existing patient education.

Poster# ARS117

Recurrence rates of sinonasal inverted papilloma

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Introduction:
Inverted papilloma (IP) is a benign sinonasal tumor associated with local destruction, malignant transformation, and recurrence rate affected by resection extent. Given the concerns with recurrence rates, this study aimed to further characterize factors associated with recurrence in primary versus revision IP resection.

Methods:
A retrospective chart review of patients undergoing IP resection between 2000-2021 was performed. Variables included demographics, tumor characteristics, intraoperative findings, surgical approach, and recurrence data. Statistical analysis compared primary and revision cases (initial surgery performed elsewhere). P-values <0.05 were considered statistically significant.

Results:
A total of 245 patients included 167 primary and 78 revision cases. There were 176 (71.8%) males. Mean age was 60.5 years. Demographics and presenting symptoms were similar between primary and revision cases. Carcinoma in situ (CIS) or malignancy was noted in 30 (12.2%) cases. Revision cases versus primary cases were more likely to have multiple IP attachment sites (22% vs. 8%, $p<0.0001$), higher rates of CIS/malignancy (18% vs. 9%, $p=0.049$), and higher likelihood of undergoing combined open/endoscopic approach (40% vs. 16%, $p<0.0001$). After exclusion of cases with malignancy or incomplete resection, 26 cases recurred (13.6%), with similar recurrence rates between primary (12%) and revision cases (17%, $p=0.44$). Median time to recurrence was 14.5 months.

Conclusion:
IP patients are at high risk of recurrence. Patients undergoing revision surgery can achieve similar recurrence rates to primary cases when complete resection is achieved through addressing multiple attachment sites and use of a combined approach if indicated.

Poster# ARS118

Refining endoscopic skull base CSF leak repair: What recent evidence shows

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Context:
Endoscopic endonasal repair has become the preferred approach for skull base CSF leaks, driven by reduced morbidity and refined reconstruction techniques. Recent advances focus on optimizing closure methods rather than introducing new technologies, with improving outcomes even in complex or high-flow defects.

Objective:
To review literature from 2020–2025 to assess current practices, evolving reconstructive strategies, and their impact on surgical success and patient outcomes.

Methods:
Meta-analyses, systematic reviews, and large institutional series were reviewed. Topics included single- vs multilayer closure, the role of vascularized flaps (particularly the nasoseptal flap), management of high-flow or revision cases, and outcomes in anatomically challenging locations.

Results:
Primary endoscopic repair success rates consistently fall around 93–94%, with higher rates after revision. Multilayer reconstruction reinforced with a vascularized flap remains the most reliable strategy for larger or deep defects. Clival and select sphenoid defects show slightly higher recurrence due to anatomic constraints. Standardized reconstruction protocols appear to reduce the influence of patient-specific risk factors such as frailty or chronic disease. Leak rates following extended endonasal approaches continue to improve. Earlier repair of spontaneous leaks may reduce meningitis risk.

Conclusion:
Endoscopic skull base reconstruction is now a dependable, versatile approach, effective even for complex or high-risk defects. Multilayer and vascularized flap techniques remain central to durable closure. Future prospective work and clearer decision pathways may further optimize management of atypical or difficult cases.

Poster# ARS119

Relationship between environmental exposures and sinonasal health

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Introduction:
Chronic rhinosinusitis (CRS) is a common inflammatory disease with multifactorial etiology. The role of environmental exposures in CRS pathogenesis is poorly understood. This study evaluated the associations between environmental exposure, disease severity, olfaction, and quality of life using the Sinonasal Occupational and Airborne Pollutant Exposure (SOAPE) survey.

Methods:
Fifty-four adult patients with sinonasal disease and two healthy controls were recruited from UNC Otolaryngology clinics in 2025. Patients completed the SOAPE and SNOT-22 surveys to assess exposures and quality of life. Disease severity was also assessed through nasal endoscopy. A subset underwent the Sniffin' Sticks olfactory exam, producing a TDI score. Linear regression analyses were performed to evaluate relationships between exposure (SOAPE) and disease outcomes.

Results:
Among the 56 patients, 96% had a history of sinonasal disease and 70% had undergone prior sinus surgery. SOAPE scores ranged from 0–145 (median=25) and showed modest correlation with higher SNOT-22 (R^2=0.059; 95% CI –0.025, 0.477), higher endoscopy scores (R^2=0.033; 95% CI –0.090, 0.429), and lower TDI scores (R^2=0.057; 95% CI –0.503, 0.781). None of these correlations reached statistical significance ($p>0.05$), though trends suggest higher exposure is associated with greater disease burden and worse olfactory function.

Conclusion:
This preliminary data suggests that greater environmental exposure, as measured by the SOAPE survey, may be associated with worse CRS-related symptom burden, more severe endoscopic findings, and impaired olfaction. While not statistically significant, the trends warrant further investigation with a larger sample size and more balanced cohort.

Poster# ARS120

Repair of the diaphragma sellae: A shift in the transsellar reconstructive paradigm

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Background:
Multilayer skull base reconstruction is the standard following endoscopic endonasal transsellar surgery (TSS). Tumor pathology, defect size and location, graft material, and surgical technique all contribute to post-TSS cerebrospinal fluid (CSF) leak rates. Our institution has implemented a novel closure technique in TSS by reinforcing the primary defect site at the diaphragma sellae (DS).

Methods:
In our technique, the diaphragma defect is evaluated after TSS. Rents are repaired primarily with aneurysm clips if possible. Collagen-based synthetic material is placed directly against the DS. Our grafts of choice are Duragen (Integra LifeSciences) and Duramatrix Conform (Stryker) given their pliable nature. This is bolstered with absorbable packing within the sella, and an onlay graft or flap is placed over the bony sellar face. A single-center retrospective review was performed on consecutive adult patients undergoing TSS with this technique. Patients with expanded approaches or those with large amounts of missing DS were excluded. Primary outcome was postoperative CSF leak. Secondary variables included grafting material, preoperative tumor size, tumor pathology, and complications.

Results:
100 patients were included. The mean preoperative tumor size was 21.7 mm, and 74% of cases were pituitary adenomas. Obvious intraoperative CSF leaks were identified in 54%. There was a 3% postoperative leak rate overall. Of 8 patients that underwent primary diaphragma clip repair, none leaked after surgery.

Conclusion:
Direct DS reinforcement in TSS reconstruction addresses the most common site of CSF leak after TSS. Restoration of DS integrity reduces hydrostatic pressure on the reconstruction to optimize long-term outcomes.

Poster# ARS121

Rethinking the role of preoperative imaging in DCR: Lessons from 515 cases

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Background:
Dacryocystorhinostomy (DCR) is the definitive treatment for nasolacrimal duct obstruction. The role of routine preoperative computed tomography (CT) imaging prior to DCR, particularly in cases undergoing an external approach, remains a subject of ongoing debate. While CT can provide valuable anatomical detail, assist in surgical planning, and identify occult pathology, its routine use is associated with increased cost, additional time, and exposure to ionizing radiation. The overall impact on clinical decision making and patient outcomes in uncomplicated cases is not well established.

Methods:
A retrospective cohort of 515 consecutive DCR candidates at a single institution from July 2018 to July 2023 was conducted. Imaging reports were available for 491/515 patients. Radiology reports were abstracted for incidental head, neck, and skull base findings. The primary endpoint was whether the scan detected findings that could have resulted in a change in management, such as referral or altered peri-operative plan.

Results:
CT identified clinically significant incidental pathology including encephalocele/meningoencephalocele (n=2), meningioma (n=6), thyroid nodule (n=2), and a previously unrecognized sinonasal squamous cell carcinoma (n=1). Clinically significant findings were identified in a total of 11/491 patients (2.2%).

Conclusions:
Routine CT detected clinically significant incidental pathology in 2.2% of patients undergoing DCR surgery at our institution. Recent studies suggest the rate of clinically significant incidental findings on sinus CT scans is as low as 3.4%. Given that CT rarely detects significant findings in this population, further investigation into the utility of preoperative CT for DCR is required.

Poster# ARS122

RF posterior turbinate nasal neurolysis

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Background:
To assess the safety and effectiveness of radiofrequency ablation of the posterior inferior turbinates targeting the intraturbinate posterior nasal nerve (RAPN) area for treating chronic rhinitis.

Methods:
This was a single-center, retrospective cohort study. Patients with a 24-hour reflective Total Nasal Symptom Score (rTNSS) of 4 or higher, experiencing chronic rhinitis symptoms for at least 6 months that were refractory to medical treatment and undergoing RAPN, were enrolled. Patient-reported outcome measures included the rTNSS and the Nasal Obstruction Symptom Evaluation (NOSE). The primary endpoint was the responder rate between 1 and 12 months, defined as a 30% or greater improvement in rTNSS from baseline. Changes in rTNSS and NOSE scores were also recorded.

Results:
A total of 97 patients were reviewed (62 male and 35 female) with a mean age of 37.1±9.6 years. Patients had a mean baseline rTNSS of 6.6 (95% CI, 6.2-7.0) and a NOSE score of 58.8 (95% CI, 54.6-63.0). At 12 months, the responder rate ranged from 87.6% (95% CI, 81.0%-94.3%) at 1 month to 90% (95% CI, 81.9%-97.8%), with significant reductions in rTNSS (mean decrease of -4.3 [95% CI, -4.9 to -3.7]) and NOSE (mean decrease of -45.3 [95% CI, -52.1 to -38.4]). The mean improvements of each subscore in rTNSS(congestion, rhinorrhea, sneezing, and nasal itching) were 58% to 76% compared to baseline. Four procedure-related adverse events were reported, and all resolved.

Conclusion:
Radiofrequency ablation of the posterior inferior turbinates provides significant relief of all chronic rhinitis symptoms with minimal adverse events.

Poster# ARS123

Rhinitis medicamentosa: A comparative analysis of treatment methodologies

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Introduction:
Rhinitis medicamentosa (RM) is a condition caused by rebound nasal congestion from the prolonged use of topical nasal decongestant sprays. Standard treatment involves cessation of decongestants and using oral and/or intranasal therapies, though their effectiveness remains poorly understood.

Objective:
To evaluate the effects of medical treatments on discontinuation of intranasal decongestants and the likelihood of requiring in-office or operating room procedures in RM patients.

Methods:
A single-institution, IRB-approved retrospective chart review of 375 RM patients was performed. Univariate logistic regression assessed the impact of intranasal and/or oral therapy on decongestant cessation and subsequent need for procedures.

Results:
Intranasal steroids increased the odds of Afrin cessation (OR = 3.33; 95% CI 1.75–6.33), with Flonase showing a specific benefit (OR = 1.87; 95% CI 1.12–3.11). No other intranasal or oral steroids were significant. Intranasal steroids were also linked to higher odds of being offered a procedure (OR = 2.73; 95% CI 1.36–5.50), particularly Flonase (OR = 2.33; 95% CI 1.32–4.09) and Rhinocort (OR = 4.54; 95% CI 1.58–13.02). Oral steroids overall showed no significant effect, though prednisone increased procedure likelihood (OR = 1.74; 95% CI 1.11–2.75), and higher oral steroid doses trended toward significance (OR = 1.001; 95% CI 1.000–1.002).

Conclusion:
Intranasal steroids – particularly Flonase – were more strongly associated with successful nasal decongestant cessation compared with oral steroids in RM patients. Use of intranasal steroids—along with prednisone and higher oral steroid doses—was also linked to an increased likelihood of patients requiring procedural intervention.

Poster# ARS124

Rhinologic predictors of long COVID (LC)

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Background:
In 2024, the National Academies defined Long COVID (LC) as symptoms persisting or worsening ≥3 months after SARS-CoV-2 infection. Nasal congestion and chemosensory loss are common during acute illness, but their prognostic value for LC is understudied.

Methods:
We conducted secondary analysis of a longitudinal cohort of 222 adults in Puerto Rico with laboratory-confirmed SARS-CoV-2 and standardized symptom assessments during acute illness and follow-up. Predictors included nasal congestion, chemosensory loss of taste/smell, cough, and dyspnea. Logistic regression models were adjusted for age ≥65, sex, hospitalization, and multimorbidity.

Results:
Of 222 patients, 165 met the 2024 LC definition. Mean age was 47.8 ± 15.8 years; 79.30% were female. 21% were hospitalized during acute infection. Most (87.00%) received three vaccine doses, and 89.00% reported at least one underlying condition (22.70%). Nasal congestion ($p = 0.003$) was significantly associated with LC, while chemosensory symptoms were not. In adjusted models, nasal congestion remained an independent predictor (aOR 2.46, 95% CI 1.13–5.38). Respiratory symptoms were also predictive, including cough (aOR 4.06, 95% CI 1.99–8.29) and dyspnea (aOR 3.76, 95% CI 1.80–7.86).

Conclusion:
Nasal congestion was identified as an independent predictor of LC, surpassing chemosensory loss. Early recognition of nasal symptoms may help identify individuals at risk for persistent post-COVID sequelae and underscores the role of rhinologic evaluation in LC risk.

Poster# ARS125

Risk factors for Draf 2B failure in patients with chronic rhinosinusitis with nasal polyps

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Introduction:
Draf 2B frontal sinusotomy is often performed in conjunction with functional endoscopic sinus surgery (FESS) for patients with chronic rhinosinusitis with nasal polyposis (CRSwNP). There is limited data on factors driving treatment failure requiring revision surgery or biologics.

Materials and Methods:
All CRSwNP patients who underwent FESS with Draf 2B and steroid irrigations from 2015 to 2025 were included. "Failure" was defined as disease recurrence requiring a Draf 3 or biologics. Data on demographics, comorbidities, structured histopathology, serum markers, peri-operative SNOT-22 scores, and CT imaging features were compared between groups.

Results:
A total of 180 patients were included with 158 (87.8%) successes and 22 (12.2%) failures. Compared to successes, Draf 2B failures were more likely to have undergone prior surgery (95.5% vs. 50.6%; $p = 0.001$) and have aspirin exacerbated respiratory disease (AERD; 50.0% vs. 19.6%; $p = 0.005$). The failure rate for 42 patients with AERD was 26.2% versus 9.0% for patients without AERD ($p = 0.033$). Asthma alone was not associated with Draf 2B failure (9.9% for asthmatics vs. 5.3% for non-asthmatics; $p = 0.545$). Other comorbidities, demographic factors, pre-operative SNOT-22, serum eosinophilia, total IgE levels, tissue eosinophilia, and frontal ostium anterior-posterior diameter were not associated with polyp recurrence.

Conclusion:
Most CRSwNP patients experience long-term disease control after FESS with Draf 2B sinusotomy and steroid irrigations. However, AERD affords a higher risk for recurrence, and pre-operative counseling for these patients warrants discussion on the natural disease course and possible need for further surgical or systemic therapies.

Poster# ARS126

Risk factors for the early postoperative recurrence of allergic fungal rhinosinusitis

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Background:
Allergic fungal rhinosinusitis (AFRS) is known to have a high recurrence rate even after appropriate surgical and medical interventions. The objective of this study was to examine the risk factors for the postoperative recurrence of AFRS with a special attention to the early postoperative period (≤ 6 months).

Methods:
A single-institutional retrospective chart review of AFRS patients who did not have previous surgery was performed. Recurrence risk factors investigated included: patient demographics, socioeconomic factors, medical history, preoperative characteristics (orbitocranial symptoms, SNOT-22 score, Lund-Mackay score, Lund-Kennedy score), postoperative characteristics (adherence to topical steroids and saline rinses, oral steroid use, oral antibiotic use), and intraoperative findings.

Results:
Fifty-three AFRS subjects were included. Black non-Hispanic subjects had a significantly higher risk of postoperative AFRS recurrence at 3 months (P = 0.023; Cramer's V = 0.51) and 6 months (P = 0.028; Cramer's V = 0.45) compared to other races/ethnicities. At 12 months postoperatively, no difference in recurrence rate was observed among different races/ethnicities. Multivariable logistic regression revealed that being Black non-Hispanic increased the odds of early (≤ 6 months) postoperative recurrence after adjusting for relevant confounders.

Conclusion:
AFRS is a recurrent disease process. However, data on the postoperative prognosis of this sinonasal pathology is lacking. This study suggests that race/ethnicity is associated with the early postoperative recurrence of AFRS with Black non-Hispanic patients having a higher risk of recurrence within 6 months of surgery.

Poster# ARS127

Risks of epistaxis and chronic rhinosinusitis in oral isotretinoin vs topical retinoid users

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Systemic isotretinoin has been shown to disrupt nasal mucosal integrity, mucociliary clearance, and reduce Schirmer test scores. Studies have demonstrated dose-dependent impairment of mucociliary transport and increased severity of nasal dryness, yet no large population-based study has quantified the comparative risk of epistaxis or chronic rhinosinusitis (CRS) in isotretinoin users relative to topical retinoid users. A retrospective cohort study was performed using the TriNetX Research Network. Two groups were identified: new users of oral isotretinoin and new users of topical retinoids (tretinoin, adapalene, tazarotene) without oral exposure. Patients with prior epistaxis, CRS, nasal surgery, or coagulopathy were excluded. Primary outcomes were new diagnoses of epistaxis (R04.0) and CRS (J32.x) following drug initiation. Propensity score matching (1:1) was applied to control for demographic and clinical variables. After matching, 190,320 patients remained in each cohort. Epistaxis occurred in 3,050 isotretinoin users (1.62 percent) compared with 1,139 topical-only users (0.61 percent), yielding a risk ratio of 2.68 (95 percent CI 2.50–2.86, $p < 0.0001$). CRS occurred in 3,551 isotretinoin users (1.92 percent) and 3,199 topical-only users (1.73 percent), with a risk ratio of 1.11 (95 percent CI 1.06–1.16, $p < 0.0001$). In this large real-world cohort, oral isotretinoin use was associated with a more than two-fold increased risk of epistaxis and a modest but significant increase in CRS compared with topical therapy. This highlights the importance of preventive nasal care during treatment. Improved patient counseling and early ENT evaluation may reduce morbidity associated with these sinonasal adverse effects.

Poster# ARS128

Role of elective neck dissection in sinonasal adenoid cystic carcinoma

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Objectives:
Sinonasal adenoid cystic carcinoma (SACC) is a rare malignancy. Previous reports have noted occult nodal metastases (ONM) rates at approximately 17% and underlined its prognostic significance in the head and neck region; however, site specific information to the sinonasal tract and the benefit of elective neck dissection (END) is unclear. Our aim is to elucidate the impact of END using a national database.

Methods:
We queried the 2004-2023 National Cancer Database (NCDB) for all patients with SACC with no clinical evidence of distant or occult nodal metastases. Patients were categorized based on performance of END. ONM rates were calculated. Univariate and multivariate analyses were performed.

Results:
A total of 1,450 patients met inclusion criteria. The average age of the cohort was 59 years. The majority of patients were female (53.4%), Caucasian (77.7%), and treated at an academic center (64.7%). The most common subsite was the maxillary sinus (n=598, 41.2%) followed by the nasal cavity (n=493, 34.0%); 50.6% of patients (n=734) had cT4 disease. END was performed for 98 patients (6.8%), of which the majority had cT3/4 disease (86.7%). The overall ONM rate was 10.2% with higher rates for patients with tumors of the nasopharynx (20%, 1/5) and nasal cavity (18%, 2/11). There was no significant difference in overall survival between the END and no END cohorts (69.3% vs. 67.4%, p=0.97). Multivariate regression analyses demonstrated no significant association between END and survival (OR=1.01 [0.70-1.44], p=0.974).

Conclusions:
While SACC often presents at advanced stages, performance of END in patients without clinical locoregional or distant disease was not associated with a survival benefit.

Poster# ARS129

Scalloping of petrous apex on CT as a novel marker for idiopathic intracranial hypertension

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Background:
Patients with undiagnosed idiopathic intracranial hypertension (IIH) are at risk for complications including cerebrospinal fluid leak and vision loss. Earlier and accurate identification of disease aids in timely management. Dilation of Meckel's cave has been associated with IIH on magnetic resonance imaging, but no similar marker has been identified on computed tomography (CT). Our objective was to examine scalloping of petrous apex (PA) on CT as a novel radiologic marker for IIH.

Methods:
We conducted a retrospective case-control study of 51 patients with diagnosed IIH and 51 controls who underwent non-contrast CT Head or Temporal Bone. Presence of PA resorption on at least one side, referred to as "scalloping" of PA, was compared between the two groups. Secondary analyses included evaluation of the degree of resorption and the presence of additional established radiologic signs of IIH.

Results:
Scalloping was present in 48 IIH patients (94.1%) versus 27 controls (52.9%, $p<0.01$). IIH patients had greater mean petrous apex depth (2.3 mm vs. 0.73 mm, $p<0.01$). Additional radiologic signs (empty/partially empty sella or arachnoid pits) were seen in 90.2% of IIH patients versus 29.4% of controls ($p<0.01$). Most patients (83.3%) had only CT Head imaging, suggesting that scalloping of PA is visible on routine CT.

Conclusion:
Patients with IIH were significantly more likely to demonstrate scalloping of PA on CT, identifying this radiologic sign as a possible IIH marker. Given the frequency of CT Head imaging, early identification could contribute to more timely diagnosis for many patients.

Poster# ARS130

Septal deviation and the eustachian tube: Revisiting the connection

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Background:
The idea that nasal septal deviation (NSD) may influence Eustachian tube function has existed for years, but recent objective testing has clarified the relationship. Modern assessments of middle-ear physiology suggest that septal shape and angulation can affect Eustachian tube opening, especially in patients already experiencing dysfunction.

Objective:
To review recent evidence evaluating whether NSD contributes to Eustachian tube dysfunction (ETD) and whether septoplasty leads to measurable functional improvement, with emphasis on objective rather than anecdotal data.

Methods:
Studies from recent years were reviewed that used validated tools—including ETDQ-7, tympanometry, tubomanometry, and Eustachian tube opening-pressure tests—before and after septoplasty in patients with clearly defined NSD.

Results:
Patients with NSD generally showed poorer baseline Eustachian tube function and more abnormal middle-ear pressures than matched controls. Following septoplasty, many demonstrated significant improvement. Tympanometry, tubomanometry thresholds, and symptom scores often improved within 1–2 months. Benefits tended to be most pronounced on the side of the deviation and were greater when the anatomical distortion was more severe.

Conclusion:
Recent evidence supports a meaningful link between NSD and ETD. In patients presenting with both conditions, septoplasty may improve not only nasal airflow but also middle-ear physiology. Further long-term, controlled studies are needed to identify which patients benefit most and how durable these improvements are.

Poster# ARS131

Severe obesity associated with increased CSF leak rate after endoscopic sinus surgery

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Background:
Cerebrospinal fluid (CSF) leak is an uncommon but serious complication of endoscopic sinus surgery (ESS). Obesity has been linked to elevated intracranial pressure and spontaneous CSF leaks, but its relationship with postoperative CSF leak following routine ESS for chronic rhinosinusitis (CRS) remains unclear.

Methods:
A retrospective cohort study was conducted using the TriNetX Global Collaborative Network, encompassing data from 158 healthcare organizations. Adults with CRS who underwent ESS were stratified by body mass index (BMI) into severe obesity (≥35 kg/m²) and normal weight (≤25 kg/m²) groups. Patients with sinonasal or skull base tumors, intracranial hypertension, or craniofacial trauma were excluded. Propensity score matching (1:1) was performed for age, sex, race, asthma, and nasal polyposis. The primary outcomes were postoperative CSF leak diagnosis and CSF leak repair within one year.

Results:
After successful matching, 14,450 patients were included in each cohort. The risk of postoperative CSF leak diagnosis was 0.6% in the severely obese group versus 0.3% among normal-weight patients (risk ratio = 2.09; 95% CI, 1.46–3.01; $p < 0.001$). The rate of CSF leak repair was likewise significantly higher among severely obese patients (0.6% vs 0.3%; risk ratio = 2.12; 95% CI, 1.47–3.04; $p < 0.001$).

Conclusion:
Severe obesity was associated with roughly twice the rate of postoperative CSF leak and need for surgical repair following ESS compared with patients of normal weight. This association suggests that elevated BMI may represent an independent risk factor to consider during preoperative counseling and surgical planning.

Poster# ARS132

Sinonasal disease and mental health

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Introduction:
Chronic sinusitis has been linked to higher mood disorder rates, but the broader psychosocial burden across sinonasal diseases is unknown. We assessed psychosocial outcomes across seven diagnoses using a large database.

Methods:
Using the NIH All of Us database, we identified 23,520 patients with ≥ two separate visits with the same ICD-coded diagnosis for nasal congestion, postnasal drip, chronic rhinitis, allergic rhinitis, non-allergic rhinitis, chronic sinusitis, or nasal airway obstruction. Patients were 1:1 matched to controls across demographics and 10 mental health and medical comorbidities. Multiple variable logistic regression evaluated associations with psychosocial outcomes. Surveys analyzed included the GAD7 and PHQ9 (scores > 10 defining anxiety and depression) and 4 questionaries assessing psychosocial health.

Results:
Patients with any of seven sinonasal conditions had greater odds of screening for depression (PHQ9 OR1.38, 95% CI 1.29–1.48) and anxiety (GAD7 OR1.56, 1.45–1.67) than matched controls. Each individual condition demonstrated increased odds, with chronic rhinitis having greatest depression risk (OR1.36,1.19-1.55) and postnasal drip the highest anxiety risk (OR 1.54, 1.2-1.98). Compared with controls, patients more often reported low mood (46% vs 38%), sleep dysfunction (67% vs 59%), and trouble concentrating (40% vs 32%) for at least several days; this pattern was consistent across all conditions (all p<0.001).

Discussion:
Common sinonasal conditions are associated with elevated depression, anxiety, and psychosocial symptom burden, suggesting the need for routine screening and integrated management in patients with sinonasal disease.

Poster# ARS133

Sinonasal mucosal melanoma: A retrospective cohort study

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Background:
Sinonasal mucosal melanoma (SNMM) is a rare and aggressive malignancy with limited data on optimal treatment approaches. This study assessed demographic and treatment factors associated with survival and recurrence outcomes.

Methods:
A retrospective chart review was performed for 28 SNMM patients. Kaplan-Meier analyses with log-rank tests assessed demographic and treatment associations with overall survival (OS), disease-specific survival (DSS), and time to recurrence (TTR). Post-hoc pairwise log-rank tests identified subgroup differences, and univariate Cox proportional hazards regression estimated hazard ratios (HRs) and 95% confidence intervals (CIs).

Results:
The cohort included 14 males and 14 females with a mean age of 67.8 years (range: 37-87). Demographics (sex, age, race) were not significantly associated with outcomes. The recurrence rate was 88.9% with an average TTR of 15.6 ± 16.0 months. Median OS and DSS were 37.4 and 58.1 months, respectively.

Kaplan-Meier analysis demonstrated surgery (n=20) improved OS (p=0.004) and TTR (p=0.035), while its effect on DSS (p=0.150) did not reach significance. Adjuvant radiation therapy (RT) (n=16) was associated with improved OS (HR: 0.166, CI: 0.048-0.557, p=0.005), DSS (HR: 0.211, CI: 0.056-0.679, p=0.009) and TTR (HR: 0.299, CI: 0.120-0.749, p=0.011). Primary RT (n=6), primary systemic therapy (n=5), and adjuvant systemic therapy (n=7) had no significant associations with outcomes. The role of neoadjuvant immunotherapy (n=3) was not specifically addressed in this analysis.

Conclusion:
Prognosis for SNMM was poor. In this single institution series, surgery and adjuvant RT were associated with improved OS and TTR, with adjuvant RT also improving DSS.

Poster# ARS134

Sinonasal sarcoidosis: A systematic review

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Objective:
Sinonasal sarcoidosis (SNS) can be challenging to diagnose and treat. Our objective was to review the clinical presentation, diagnosis, and medical management of SNS.

Methods:
A systematic review was conducted using CINAHL, Cochrane Library, PubMed, and Scopus through August 2025. Eligible studies included case reports, case series, and observational studies. Extracted variables included demographics, symptoms, diagnostic findings, treatments, and outcomes. Data was summarized as means, proportions, and 95% confidence intervals (CI). Risk of bias was assessed with the Joanna Briggs Institute tool.

Results:
Seventy studies (n=124) were included. Mean age was 42.1 years (95% CI: 39.8–44.3), and 70.2% were female. Patients reported a mean of 2.3 sinonasal symptoms (95% CI: 1.7–2.1) with an average duration of 37.9 ± 56.4 months before diagnosis. Common symptoms were nasal obstruction (55.8%), rhinorrhea (30.2%), nasal deformity (25.6%), and congestion (22.1%); 15.3% had isolated sinonasal disease. Systemic findings included rash (35.9%), lymphadenopathy (23.4%), and joint pain/swelling (22.9%). Diagnosis was made by endoscopic biopsy in 88.5%, with mucosal inflammation (36.9%), crusting (29.2%), and hypertrophy (21.5%) the most common findings. Serum ACE was elevated in 61.3% (mean 75.3 ± 31.8 nmol/mL/min). Oral corticosteroids, topical corticosteroids, and antimetabolites were used in 75.0%, 26.7%, and 23.3% of cases; improvement rates were 71.4% (local) and 80.2% (systemic).

Conclusion:
There is typically a prolonged delay between onset of symptoms and the diagnosis of SNS. Understanding the common presenting symptoms, endoscopic features, and laboratory findings may facilitate proper diagnosis and treatment.

Poster# ARS135

Sleep dysfunction in CRS and quality of life recovery after FESS

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Background:
Sleep dysfunction is a prominent feature of chronic rhinosinusitis (CRS), but how sleep burden and postoperative improvement compare across CRS phenotypes or in patients with comorbid asthma, has not been systematically examined.

Methods:
Data from a prospective single-institution CRS database (2021–2025) were analyzed. Preoperative assessments included SNOT-22 sleep burden score (SBS), total SNOT-22, and RSDI for quality of life (QoL), and Lund–MacKay (LM) scores for radiologic severity. Postoperative scores were collected at 3-4 and 6-9 months after FESS. Baseline measures were compared between CRSwNP and CRSsNP and by asthma status. Longitudinal changes in SBS, SNOT-22, and RSDI were evaluated, and Spearman correlations assessed relationship between sleep and overall improvement.

Results:
105 patients were included. CRSwNP had worse baseline radiologic disease (LM 17.1 vs 12.8), yet baseline SBS was similar between phenotypes (median SBS 12 for both). Total SNOT-22 and RSDI were comparable. After FESS, SBS improved in the overall cohort (median reduction 7–8 points), paralleling total SNOT-22 improvement (–26 to –31). SBS improvement strongly correlated with overall QoL improvement ($r \approx 0.8–0.9$). Patients with asthma demonstrated higher baseline SBS (12 vs 10.5) and greater early improvement at 3–4 months (Δ –9 vs –4.5), with similar improvement by 6–9 months (Δ –7 vs –8.5).

Conclusion:
Sleep dysfunction affects CRSsNP and CRSwNP patients equally despite higher radiologic burden in CRSwNP, suggesting influences beyond objective disease severity. FESS produced similar meaningful sleep and QoL improvements across phenotypes, with asthmatic patients showing higher baseline SBS and marked postoperative improvement.

Poster# ARS136

Sleep-related changes following TCRF treatment of NVC

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Objective:
To evaluate real world sleep and symptom improvement among patients with nasal valve dysfunction (NVD) and severe or extreme nasal airway obstruction (NAO) treated with temperature-controlled radiofrequency (TCRF), using electronic medical record (EMR) data and prospectively collected patient surveys to assess sleep related outcomes.

Methods:
This real-world study included patients from 8 U.S. otolaryngology practices who underwent TCRF for NAO between January 1, 2020, and December 31, 2023. Analysis focused on TCRF patients with available baseline EMR NOSE Scores and post procedure survey Epworth Sleepiness Scale (ESS) and Nasal Obstruction Symptom Evaluation (NOSE) scores. Descriptive statistics and p-values were calculated.

Results:
Among 238 patients, 22 patients had both EMR NOSE and post procedure ESS and NOSE survey data. Mean ESS improved from 8.0 (95% CI, 5.6–10.3) at baseline to 4.3 (95% CI, 2.7–6.0) post procedure, reflecting a mean reduction of 3.6 points consistent with meaningful improvement in daytime sleepiness. Across the larger survey only cohort (n=81), the mean post procedure ESS score was 6.0 (95% CI, 5.0–7.1), indicating normalization of daytime alertness in most patients. Similarly, the "trouble sleeping" component of the NOSE score improved from 2.3 (95% CI, 2.1–2.6) pre procedure to 1.2 (95% CI, 1.0–1.4) post procedure (p<.001), demonstrating consistent improvement across sleep related domains.

Conclusions:
This real-world analysis demonstrates that TCRF provides significant improvement in sleep outcomes and daytime alertness for patients with NAO, underscoring the importance of restoring nasal patency in improving both NAO and sleep outcomes.

Poster# ARS137

SLIT-induced changes in allergen reactivity and biomarkers in HDM-allergic rhinitis

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Background:
In allergic rhinitis (AR) patients sensitized to house dust mite (HDM) allergens, allergen immunotherapy (IT) is often recommended because HDM exposure is unavoidable, yet its effects on systemic or local allergen challenge tests and biomarkers remain unclear. This study therefore aimed to evaluate the clinical efficacy of IT and its associated changes in allergen challenge tests and biomarkers in HDM-AR patients.

Methods:
From 2018 to 2024, patients with HDM-sensitized intractable AR who received at least one year of sublingual immunotherapy (SLIT) with European (Dip) and American (Df) HDM purified extract were retrospectively reviewed. Baseline and final total control scores (TCS), skin prick tests (SPT), nasal provocation tests (NPT), serum IgE and eosinophil counts, and fractional exhaled nitric oxide (Feno) were analyzed. Changes after SLIT were evaluated using paired t-tests and McNemar tests.

Results:
A total of 17 patients with mean age of 24.2±2.7 were analyzed, with a mean SLIT duration of 2.1±0.6 years. TCS significantly decreased ($p<0.05$), and the proportion of severe AR declined from 90% to <10%. Although SPT positivity did not change, HDM wheal sizes decreased significantly (all $p<0.05$). NPT positivity decreased from 100% to 30%, with significant reductions in all 5 AR symptom scores at 15 minutes (all $p<0.05$). Serum eosinophil counts, total IgE, and HDM-specific IgE (Dip and Df) showed no significant changes, whereas Feno decreased from 33.1 to 22.7 ppb ($p=0.003$).

Conclusion:
In HDM-sensitized AR patients, two years of SLIT reduces clinical severity by 90%, significantly decreases HDM reactivity on SPT and NPT and lowers Feno, while serum eosinophils and total/specific IgE remain unchanged.

Poster# ARS138

Small business grants awarded by the national institutes of health for rhinologic diseases, 1984-2024

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Introduction:
The National Institutes of Health (NIH) Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs provide over $1 billion non-dilutive seed funding each year to support the development of innovative products and address unmet public health needs. However, the extent to which the SBIR/STTR programs have supported rhinologic product development remains unclear.

Methods:
We queried the NIH Reporter Database to perform a cross-sectional analysis of all SBIR (R41/R42) and STTR (R43/R44) awards for projects targeting disease of the nasal cavity, paranasal sinuses, or anterior skull base, between inception and 2024. For each identified award, we categorized mechanism (SBIR/STTR), funding phase (I/II), disease area, and product type (diagnostic device/therapeutic device/drug). We used descriptive statistics to characterize awards and inflation-adjusted award amounts using the biomedical research and development price index.

Results:
Between 1985-2024, NIH awarded $53.6 million in small business grants for 46 products targeting rhinologic disease. Among these products, 35 (of 46; 76.1%) were supported by STTR grants and 19 (of 42 eligible; 45.2%) progressed from Phase I to II funding. The majority of grants supported development of diagnostic (n=21; 45.7%) or therapeutic (n=12; 26.1%) devices. The most commonly targeted disease areas were olfactory disorders (n=15; 32.6%), sinusitis (n=7; 15.2%), and nasopharyngeal carcinoma (n=7, 15.2%).

Conclusions:
NIH has awarded relatively few SBIR/STTR grants to support rhinologic product development. Given the prevalence and persistence of rhinologic disease, barriers to product development and funding merit exploration.

Poster# ARS139

Smell and taste impairment and ultra processed food consumption in a national U.S. sample

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Objective:
Ultra processed foods (UPFs) are nutritionally poor and linked to chronic health conditions. Meanwhile, chemosensory disruptions (CSD) are associated with dietary changes and have emerged as early markers of unhealthy aging and chronic disease. This study examines whether CSD is linked to greater UPF consumption, connecting sensory loss with harmful dietary patterns.

Methods:
We analyzed 1,974 adults from the 2013-2014 cycle of the National Health and Nutrition Examination Survey with complete dietary intake, chemosensory examination, and questionnaire data. Dietary intake was assessed via 24-hour recall, and all items were classified using the Nova system. We compared UPF intake between adults with and without CSD, defined as both self-reported olfactory/gustatory dysfunction (sOD/sGD) and measured olfactory/gustatory dysfunction (mOD/mGD). Survey-weighted ordinal and multinominal logistic regressions were used to evaluate the association between CSD and UPF consumption quartiles, adjusting for sociodemographic and comorbid covariates.

Results:
Individuals with mGD consumed a higher mean percentage of UPFs compared to those without mGD (55.1% vs 52.0%, P =0.07). In adjusted models, mGD was associated with 43% higher odds of being in a higher UPF consumption quartile (OR 1.43 [95%: 1.12, 1.82]), and 84% higher odds of being in the top quartile (OR 1.84 [95%: 1.19, 2.85]). No associations were observed between sOD, sGD, or mOD with UPF consumption.

Conclusion:
Taste impairment is associated with greater UPF consumption, highlighting a potential consequence of taste dysfunction on dietary habits and related health outcomes. Future investigations should further evaluate how CSD impacts healthy intake.

Poster# ARS 140

Social determinants of health and olfaction and cognition

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Background:
The association between social determinants of health (SDoH) and health outcomes has long been established. Age-related olfactory dysfunction (OD) is a common issue associated with diminished quality of life that may also serve as a prodromal symptom of neurocognitive disease. The impact of individual and geographic SDoH's on age-related OD and cognitive function is not well understood.

Methods:
This observational prospective study enrolled participants aged 50 years and older (n=264) from Charleston, SC, and surrounding communities. Individual SDoHs were measured from self-reported health and demographic information. Surrogate SDoH variables were measured using addresses in the United States census databases. Olfaction was assessed with Sniffin' Sticks and measured by threshold, discrimination, and identification (TDI) scores. Fluid cognition scores were measured using the National Institutes of Health (NIH) cognition toolbox. Bivariate and multivariate linear regression were performed to determine associations.

Results:
Worse olfaction was associated with increasing age (B=-0.31, t=-6.26, p<0.001), sex (B=-1.84, t=-1.89, p=0.06), and low food access at 1 and 10 miles (B=-1.77, t=-1.75, p=0.08). Worse fluid cognition was associated with increasing age (B=-0.26, t=-3.52, p<0.001), male sex (-B=2.65, t=-1.84, p=0.07), non-White race (B=-9.04, t=-4.68, p<0.001), anxiety (B=-4.30, t=-3.09, p=0.002), Distressed Community Index (DCI) (B=-0.09, t=-3.00, p=0.003) and low food access at 1 and 20 miles (B=-4.03, t=-2.72, p=0.007).

Conclusion:
Older age, male sex, and low food access were SDoH measures that were associated with impaired olfaction and cognition, while additional variables were associated with cognition.

Poster# ARS141

Socioeconomic determinants of dupilumab prescription and adherence among patients with CRSwNP

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Introduction:
Despite the growing use of dupilumab for CRSwNP, socioeconomic status (SES) may limit access due to high cost. Data evaluating the impact of SES on prescription and treatment persistence patterns is limited.

Objective:
To identify SES determinants of dupilumab use among CRSwNP patients.

Methods:
A single-institution, retrospective cohort study of CRSwNP patients diagnosed from 2015 to 2025 was conducted, excluding those receiving neither surgery nor dupilumab. Demographics, comorbidities, insurance, and dupilumab utilization were obtained from electronic medical records. Median income, metro status, and hospital distance were obtained from 2020 census ZIP-code data. Unfiltered and filtered (excluding diagnosis dates before June 2019) univariate and multivariate logistic regressions were performed for prescription patterns, and Poisson analyses for refill rate.

Results:
Among 795 CRSwNP patients, 269 (33.8%) were prescribed dupilumab. In unfiltered logistic multivariate analysis, prescription was more likely with private insurance (odds ratio [OR] 1.63), asthma (OR 1.62), and shorter travel distance (OR 0.971). After filtering, CT score (OR 1.05) and asthma (OR 1.86) were significantly associated with dupilumab prescription. Unfiltered Poisson showed higher refill counts were seen in patients with allergic rhinitis (estimate [E] 1.30) and white patients (E 1.21). When filtered, refill rates were increased with higher income (per $10k: E 1.06).

Conclusion:
Clinical severity and SES-related factors such as travel distance and insurance may influence dupilumab prescription, while income may predict treatment persistence in CRSwNP patients. These findings highlight potential SES barriers to biologic therapy in CRSwNP.

Poster# ARS142

Soft-tissue morbidity after rhinoplasty: Meta-analysis of piezoelectric vs conventional osteotomy

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Introduction:
Periorbital edema and ecchymosis are common sources of morbidity following rhinoplasty. Piezoelectric osteotomy has been proposed to reduce soft-tissue trauma compared with conventional osteotomes, but its clinical impact remains unclear.

Methods:
A systematic review and meta-analysis were conducted to compare the postoperative ecchymosis and edema following internal lateral osteotomy performed with a piezoelectric device versus the conventional technique. Five databases were searched, and four randomized controlled trials met the inclusion criteria (n = 245). Effect sizes were calculated as standardized mean differences (SMD) using a random-effects model with inverse-variance weighting. Heterogeneity was assessed using I^2.

Results:
All four studies reported ecchymosis at day 7 postoperatively. Piezoelectric osteotomy resulted in significantly less ecchymosis than the conventional technique (SMD = -0.74; 95% CI: -1.40, -0.08; p = 0.03). A random-effects model was utilized due to high heterogeneity (I^2 = 85.8%). Edema was also evaluated in all four studies at postoperative day 7. Meta-analysis indicated a nonsignificant trend favoring piezoelectric osteotomy (SMD = -0.61; 95% CI: -1.36, 0.13; p = 0.11).

Conclusion:
Piezoelectric internal lateral osteotomy reduces postoperative ecchymosis when compared with the conventional osteotome technique and may reduce edema, although this did not reach statistical significance. Despite high heterogeneity, these findings support the use of piezosurgery to reduce soft-tissue morbidity following rhinoplasty. Additional high-quality studies are needed to better define its impact on patient comfort, edema, and recovery outcomes.

Poster# ARS143

Study design and randomization as predictors of dissemination in endoscopic sinus surgery trials

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Background:
Clinical trials are fundamental to advancing rhinologic care. However, the integrity of the evidence base is contingent upon successful dissemination. It remains unclear whether structural design elements—such as randomization and study type—serve as independent predictors of which trials reach peer-reviewed literature.

Methods:
A cross-sectional analysis of 123 ESS clinical trials registered on ClinicalTrials.gov was performed. Trials were stratified by completion, results reporting, and publication. Chi-squared and Wilcoxon rank-sum tests analyzed associations between design rigor (Allocation, Study Type) and dissemination.

Results:
Of 100 completed trials, dissemination was low: only 37% reported results to the registry and 15% achieved publication. Design rigor was a significant predictor. Trials posting results were overwhelmingly Interventional (97.3%) rather than Observational (p<.001). They were also significantly more likely to utilize Randomized allocation (p=.013). Similarly, publication was strongly associated with Allocation (p=.02), with randomized trials comprising the vast majority of published literature. Additionally, funding was not a significant predictor (p=.70).

Conclusion:
Study design, rather than funding or enrollment volume, functions as the primary determinant of whether trial data reaches the public. A clear disparity in dissemination was identified. Randomized, interventional trials currently populate the evidence base, while non-randomized and observational studies largely fail to report or publish their results. These findings underscore the critical role of structural rigor and emphasize the need to prioritize reporting of all completed trials to mitigate research waste.

Poster# ARS144

Suprasellar extension of pituitary tumors and olfactory outcomes after transsphenoidal approach

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Introduction:
A known risk of transsphenoidal pituitary surgery is olfactory disturbance. Our objective was to assess if degree of suprasellar extension of pituitary tumors was associated with worse olfactory outcome postoperatively.

Methods:
We identified patients at our institution undergoing transsphenoidal pituitary surgery from July 2023 to August 2025. Demographic and clinical data was collected via chart review. Suprasellar extension was measured on preoperative imaging as the distance of superior tumor extension above the planum. SNOT-22 score specific to the smell and taste loss question, QOD-NS, and BSIT data was collected pre- and postoperatively at 3-6 months. Univariate and multivariate analysis identified predictors of olfactory function.

Results:
154 patients were identified, 63% (n=97) female and with median age of 48.4 years. All had SNOT-22 data; 32 of these patients had QOD-NS data available and 31 had BSIT data.

The SNOT-22 smell and taste score on average increased by 0.6 from pre- to postoperative scores (postoperative mean 1.0). In univariate and multivariate regression, the degree of tumor extension above the planum was not associated with worse postoperative smell and taste score.

QOD-NS scores increased from 0.2 to 0.7 from pre- to post-surgery; BSIT scores were largely stable (9.7 to 9.8). Suprasellar extension >0mm was associated with a lower BSIT score postoperatively (10.7 vs. 9, p=0.001).

Conclusion:
Suprasellar tumor extension did not predict smell and taste outcome as measured via subjective measures but was associated with a small objective decrease in smell. However, given a BSIT score of 9 is considered normal, this decrease is likely subclinical.

Poster# ARS145

Systematic review of efficacy and subgroup predictors of biologic and ESS response in CRSwNP

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Background:
6 biologics(4 FDA-approved) and endoscopic sinus surgery(ESS) treat refractory chronic rhinosinusitis with nasal polyposis(CRSwNP).No trials have directly compared these therapies. We synthesized efficacy and subgroup data from phase 3 RCTs comparing biologics to placebo and ESS to placebo or medical therapy.

Methods:
We reviewed PubMed/trial registries for CRSwNP biologic/ESS phase 3 RCTs and subgroup analyses, extracting effect sizes(SNOT-22,nasal polyp score[NPS]) and interaction p-values.

Results:
16 publications from 8 RCTs(n=3,249;6 biologics,2 ESS) were included. Baseline severity and follow-up varied. By indirect comparison, tezepelumab showed the largest effect sizes(SNOT-22 −27;NPS −2.1), followed by dupilumab(SNOT-22 −17 to −21;NPS −1.7 to −2.1), then mepolizumab and omalizumab(SNOT-22 −15 to −17). Benralizumab improved NPS(−0.6) but not SNOT-22. Depemokimab showed SNOT-22 −8;NPS −0.7. ESS showed benefit(SNOT-22 −4.9 to −21.9) that varied by comparator(medical therapy or placebo) and follow-up. BEC, recent surgery, and NSAID-ERD predicted dupilumab response; asthma predicted benralizumab response; baseline severity predicted ESS response. Tezepelumab and omalizumab showed consistent efficacy across subgroups.

Conclusion:
ESS and biologics improve CRS disease severity. Cross-trial differences in baseline disease severity, follow-up duration, and comparators(placebo or conventional medical therapy) limit interpretation of comparisons between ESS and biologics. Within this context, tezepelumab, dupilumab, and ESS suggest large improvements compared to placebo. Predictors of response differ across therapies, highlighting the need for data directly comparing ESS and biologics and personalized treatment strategies.

Poster# ARS146

The impacts of chronic hyperglycemia and diabetes on endoscopic sinus surgery outcomes

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Introduction:
Chronic hyperglycemia and Type 2 Diabetes (T2DM) have shown to impair immune function and slow wound healing, potentially impacting post-surgical outcomes.

Objective:
To investigate the effect of chronic hyperglycemia and T2DM on post-operative outcomes within a 1-year period after endoscopic sinus surgery (ESS).

Methods:
The TriNetX database was queried for adult patients (18 and older) who underwent ESS, identified by Current Procedural Terminology (CPT) codes. Patients were grouped according to their HbA1C (normal or greater than 6.5), presence of T2DM diagnosis, and presence of nasal polyps. Measures of Association analysis was used to assess revision surgery outcomes. A t-test was used to assess post-operative mupirocin, tobramycin, or gentamicin use, defined as the number of prescriptions after surgery.

Results:
A total of 15,191 patients met final inclusion criteria. In patients without nasal polyps, those with T2DM with controlled HbA1C and those with high HbA1C had higher odds of revision than those without T2DM and a normal HbA1C (OR = 1.55, [1.17, 2.05]; OR = 1.45 [1.14, 1.85]). The results were similar for those with nasal polyps (OR = 1.76, [1.28, 2.28]; OR = 1.63, [1.25, 2.11]. Additionally, in patients with nasal polyps, those with T2DM with controlled HbA1C had higher odds of revision than those with elevated HbA1C (OR = 1.281, [1.041,1.577]). Mupirocin, tobramycin, and gentamicin use did not show statistical significance between groups.

Conclusion:
Patients with T2DM with controlled HbA1C and those with elevated HbA1C had higher rates of revision surgery compared to patients without T2DM and a normal HbA1C. T2DM with controlled HbA1C had higher odds of revision in the polyp group.

Poster# ARS147

The state of AI in rhinology: Gaps in clinical development, risk of bias and reporting

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Introduction:
Artificial intelligence (AI) and machine learning (ML) models are emerging for diagnostic and prognostic applications in rhinology. However, a gap exists in systematically evaluating their clinical relevance, methodological rigor, and reporting quality. This systematic review addresses these crucial aspects within the current landscape of AI/ML models in rhinology.

Methods:
A systematic review was performed across MEDLINE, EMBASE, Cochrane CENTRAL, and Web of Science. Data were extracted on study characteristics, clinical development stage, risk of bias (assessed using PROBAST: Prediction model Risk of Bias Assessment Tool), and completeness of reporting (assessed with TRIPOD-AI).

Results:
Of 4,272 studies screened, 67 studies were included, primarily conducted in hospital/academic settings. All studies were exclusively in the pre-clinical evaluation phase (development and in silico testing); none had progressed to formal clinical evaluation or monitoring stages. Methodologically, 35 out of 67 studies exhibited a high or unclear risk of bias. Reporting quality was also poor, with a median adherence to the TRIPOD-AI checklist of only 48.1%. Critical items were systematically unreported across nearly all studies, including model calibration, assessments of fairness, patient and public involvement, and the public availability of the final model for independent validation.

Conclusions:
The lack of development beyond the pre-clinical stage, high risk of bias and reporting deficiencies critically undermine the trustworthiness and clinical applicability of current AI/ML models in rhinology. Adopting and adhering to better standards is needed to improve the quality of these models for potential clinical application.

Poster# ARS148
WITHDRAWN

Poster# ARS149
Timing of closed nasal reduction in pediatric nasal fractures

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Background:
Optimal timing for closed nasal reduction (CNR) in pediatric patients remains controversial, with concerns that accelerated bone healing may necessitate immediate intervention to prevent permanent deformity. The objective of this study was to compare subsequent rhinoplasty rates between acute and delayed CNR in pediatric nasal fracture patients.

Methods:
A retrospective cohort analysis was conducted using the TriNetX database of patients under 18 years with nasal fractures who underwent CNR 2010 to 2019. Patients with congenital craniofacial malformations or past/concurrent skull/facial fractures were excluded. The acute treatment group underwent CNR within 7 days of fracture, while the delayed group underwent CNR at 8 days or later. The primary outcome was subsequent primary rhinoplasty (CPT 30400, 30410, 30420) performed anytime after the CNR till December 2025.

Results:
A total of 924 patients underwent acute CNR and 3,124 underwent delayed CNR. Subsequent rhinoplasty rates were 1.30% (n = 12) in the acute group and 1.76% (n = 55) in the delayed group. There was no significant difference in the rates of rhinoplasty rates between the acute and delayed treatment groups (risk ratio: 0.74, 95% CI: 0.40-1.37, p = 0.33). After propensity score matching for age, there still was no significant difference in rates of rhinoplasty (RR: 0.53, 95% CI: 0.26-1.08, p = 0.08).

Conclusion:
This analysis found no significant difference in rhinoplasty rates between acute and delayed CNR for pediatric nasal fractures. These findings may suggest that strict adherence to early reduction timelines may not be necessary to prevent subsequent need for rhinoplasty in the future, potentially allowing for more flexibility in scheduling CNR.

Poster# ARS150

Timing of venous sinus stenting in spontaneous CSF leaks

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Background:
Spontaneous cerebrospinal fluid (CSF) leaks are frequently associated with idiopathic intracranial hypertension (IIH) driven by venous sinus stenosis. Venous sinus stenting (VSS) effectively lowers intracranial pressure, but the optimal timing of stenting relative to surgical leak repair remains unclear. The decision to stent early vs late must balance preventing recurrence against postoperative bleeding risks from anticoagulation.

Methods:
A systematic review was performed following PRISMA guidelines and registered with PROSPERO. Medline, Embase, and Scopus were queried for studies reporting timing and outcomes of VSS after spontaneous skull base CSF leak repair. Patients were categorized into early (≤90 days) and late (>90 days) VSS groups. The primary outcome was leak recurrence.

Results:
A total of 6 studies (5 published, 1 institutional) including 46 patients met criteria. The cohort was predominantly female (n=36, 78.3%) with a mean age of 51.9 years. Eighteen patients (40%) underwent early VSS (median 55 days), while 27 (60%) underwent late VSS (median 365 days). Overall re-leak rate was 8.7% (4/46). Recurrence occurred in 1/18 (5.6%) early patients versus 3/27 (11.1%) late patients. There were no significant differences in leak recurrence (5.6% vs 11.5%, p=0.63) between early and late cohorts. Early cohort patients were significantly younger (43.4 vs 56.9 years, p<0.001). VSS-related complications occurred in 3 patients (6.5%).

Conclusion:
This pooled analysis reveals that early VSS has a favorable safety profile when compared to late stenting. These findings support VSS as a safe adjunctive treatment in CSF leak patients with IIH and highlight the need for prospective studies to define optimal timing.

Poster# ARS151

Total intravenous vs inhalation anesthesia in endoscopic sinus surgery: A systematic review and meta-analysis

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Background:
Endoscopic Sinus Surgery (ESS) requires optimization of surgical field conditions to provide enhanced visibility. It is theorized that choice of anesthetic can determine these conditions. This study aims to assess the differences between use of total intravenous anesthesia (TIVA) and inhaled anesthesia (IA) and resultant intra-operative factors such as blood loss, surgical visibility, mean arterial pressure (MAP) control, and operative time.

Methods:
This systematic review was conducted using PRISMA guidelines. A comprehensive literature search identified 385 studies, and 14 met inclusion criteria. Further evaluation using the Oxford Jadad scale yielded 8 high-quality studies and 6 low-quality studies.

Results:
Of the 8 high-quality studies, 6 reported blood loss. 3 found that TIVA was superior to IA, while 3 found no significant difference. Of the 7 studies reporting surgical visibility, 3 found that TIVA was superior, 3 found no significant difference, and 1 found that IA was superior. 1 of the 3 studies that found TIVA superior elaborated that the difference was more pronounced in patients with higher disease severity. Of the 6 studies reporting MAP, 1 found TIVA to be superior, while 5 studies found no significant difference. Of the 8 studies reporting operative time, 1 found TIVA was superior, while 7 found no significant difference.

Conclusion:
Current evidence suggests that use of TIVA may not provide benefits with respect to MAP control or operative time. However, results are unclear regarding blood loss and surgical visibility, with a potential benefit in high-severity cases. Future studies should evaluate rates of post-operative outcomes to identify clinical benefits between the two anesthesia modalities.

Poster# ARS152

Trends in sinus surgery following FDA approval of biologics

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Background:
Functional endoscopic sinus surgery (FESS) is recommended as second-line therapy for patients with chronic rhinosinusitis (CRS) with nasal polyposis (NP), characterized by greater symptom burden, polyp recurrence, and need for revision surgery. Biologic therapies, FDA-approved in 2019, are also indicated as second-line therapy and used primarily in patients who may have required revision FESS. Despite increasing adoption, no studies have evaluated whether the introduction of biologics has influenced overall FESS utilization. This study aims to address that gap.

Methods:
A retrospective cohort study was conducted using the Research Network of the TriNetX platform. Patients with ICD diagnoses of CRS/NP from 2015 to 2024 were included. The time frame was chosen to allow insight in the years prior and following approval of the major biologic therapies from 2019 to 2021. Yearly incidence in both surgeries and diagnoses of CRS/NP were analyzed.

Results:
Out of 158,622,461 individuals, 3,852,370 had CRS/NP. Between 2015 and 2024, FESS incidence within this group increased from 0.32% to 0.45%, while CRS/NP incidence rose from 0.50% to 0.61%. In the general population, FESS utilization increased from 0.02% to 0.03% over the same period. Overall, FESS rates continued to rise, with no evidence of decline following biologic approval in 2019.

Conclusions:
Since FDA approval of biologics, FESS utilization has not declined among patients with CRS. The increase in FESS incidence persisted relative to rising CRS/NP diagnosis rates, indicating that the trend cannot be explained by diagnostic growth rate alone. Further study of biologic prescribing patterns and real-world treatment is needed to determine influence on CRS management.

Poster# ARS153

Updated survival and prognostic factors in esthesioneuroblastoma: SEER analysis of 963 patients

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Background:
Esthesioneuroblastoma (ENB) is a rare sinonasal malignancy, and contemporary population-level survival data remain limited, as prior SEER analyses extend only through 2016. We aimed to provide updated survival estimates and identify factors associated with disease-specific survival (DSS).

Methods:
Patients with histologically confirmed ENB (9522/3) were identified in SEER (2000–2022). DSS was evaluated using Kaplan–Meier estimates and multivariable Cox regression.

Results:
A total of 963 patients were analyzed. Median follow-up was 97 months. The 5- and 10-year DSS rates were 83% and 74%. On multivariable analysis, patients ≥65 years had worse survival than those <50 (HR 1.76; 95% CI 1.21–2.56; p=0.003), while female sex was protective (HR 0.71; 95% CI 0.52–0.96; p=0.025). Regional (HR 2.57; 95% CI 1.48–4.48) and distant disease (HR 5.86; 95% CI 3.38–10.13) had significantly poorer DSS than localized tumors (both p<0.001). Regarding treatment, surgery alone (HR 0.22; 95% CI 0.12–0.42; p<0.001) and surgery + radiotherapy (HR 0.24; 95% CI 0.15–0.39; p<0.001) improved DSS, with modest benefit from radiotherapy alone (HR 0.55; 95% CI 0.33–0.98; p=0.041). In sensitivity analysis among 515 patients with available grade, grade, stage, and treatment remained significant, while race, socioeconomic status, primary tumor subsite, time-to-treatment, and year of diagnosis were not associated with DSS.

Conclusion:
This is the largest contemporary SEER analysis of ENB. Stage and treatment modality are the strongest predictors of DSS, with the best outcomes in patients undergoing surgery with radiotherapy. Socioeconomic factors did not independently influence survival, providing modern national benchmarks for ENB outcomes.

Poster# ARS154
WITHDRAWN

Poster# ARS155
Vaping and incident CRS across adult age groups
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Introduction:
Vaping is increasingly common, yet its impact on chronic rhinosinusitis (CRS) and upper-airway symptoms remains poorly defined. Since inhaled aerosols may drive mucosal inflammation, irritant exposure, and impaired mucociliary clearance, we evaluated whether vaping is associated with incident CRS, nasal polyps, nasal congestion, and postnasal drip across adult age groups.

Methods:
A retrospective cohort study was conducted using the TriNetX Global Network. Adults 18–39, 40–59, and 60–79 years with and without a vaping-related disorder after April 1, 2020, were identified. Vapers were propensity matched 1:1 to non-vapers by demographics, airway disease, substance use, and comorbidities influencing sinonasal inflammation or healthcare utilization. Outcomes included incident CRS and nasal polyps; secondary outcomes were nasal congestion and postnasal drip. Diagnoses after index were compared using risk ratios (RR) with 95% CIs.

Results:
In adults 18–39, vaping was associated with higher incident CRS (RR 1.98[1.54–2.54]), nasal congestion (1.86[1.60–2.15]), and postnasal drip (1.80[1.25–2.58]). In adults 40–59, CRS (1.45[1.06–1.97]) and nasal congestion (1.73[1.43–2.09]) remained elevated; postnasal drip was not significantly different (1.07[0.65–1.77]). In adults 60–79, CRS was not significantly different (1.18 [0.72–1.94]), though nasal congestion remained elevated (1.80 [1.35–2.41]). Nasal polyps were rare and not statistically significant.

Discussion:
Vaping-related disorders are associated with higher incident CRS and increased nasal congestion and postnasal drip in young and middle-aged adults. Therefore, vaping may contribute to sinonasal morbidity, though further study of underlying mechanisms is needed.

Poster# ARS156

VivAer: A correlation between symptom scores and objective findings

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Introduction:
Nasal congestion that is unresponsive to standard medical therapy may be an indication for surgery. The minimally invasive VivAer procedure may be an effective alternative. A multi-center, prospective study showed significant improvement in patients' sleep quality, ability to breathe through their nose, and overall NOSE scores. These results were, however, obtained only from patient symptom scores. In an ongoing study, we assess objective improvement in nasal airflow secondary to the VivAer procedure by administering objective measures and patient questionnaires before and after the VivAer procedure.

Methods:
From 10/2022 through 11/2025, we conducted baseline measurements on or before the day of the procedure using PNIF meters and the SNOT-22 and NOSE questionnaires. Patients were then seen for follow up at 1, 3, and 6 months post-procedure. The same measurements conducted at baseline were repeated at these times. All necessary approvals were obtained by our IRB to conduct this research.

Results:
Participants (n=24) were 75% female and 54±14 years of age. Data clearly shows trends of improvement in all measures. Patients experienced improvement in nasal patency, as assessed using PNIF meters, by the 3-month follow up ($p = <0.0001$). Patients also experienced improvement in NOSE ($p=<0.0001$) and SNOT-22 ($p=<0.0001$) scores by the 1-month and 3-month follow-ups, respectively.

Conclusion:
Although the study is still ongoing, the VivAer procedure shows promise as a minimally invasive alternative to surgery to address nasal obstruction. Patients experienced enhanced nasal patency, along with improvements in NOSE and SNOT-22 scores, attesting to the benefits of the procedure.

Poster# ARS157

Wearable data demonstrate improved activity after sinus surgery

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Introduction:
Chronic rhinosinusitis (CRS) is associated with reduced energy, impaired function, and lower daily activity. Although sinus surgery improves symptoms and quality of life, its physiologic impact on real-world activity has not been objectively measured. This study uses linked wearable-device activity metrics and electronic health record (EHR) data from the All of Us Research Program to evaluate within-person activity changes surrounding sinus surgery.

Methods:
Adults with CRS who underwent sinus surgery were identified using an OMOP-based computable phenotype. Wearable device-derived metrics (daily steps and activity-intensity domains) were analyzed over 12-month pre- and postoperative timeframes, with a 6-week washout period around the date of surgery excluded. Linear mixed-effects models incorporating all available daily values estimated within-person change. Winsorization addressed device-related outliers.

Results:
Thirty surgical participants contributed activity data across both timeframes. Postoperatively, daily step counts increased by 516 steps/day compared with the preoperative period (6868 vs 7384, $p < 0.0005$). Very active minutes increased by 3.7 minutes/day (15.8 vs 19.5, $p < 0.0005$). A matched nonsurgical CRS reference group (6:1 matched on age, gender, race, asthma) showed no improvement in step count (5946 vs 5936, $p = 0.851$) or vigorous activity (11.5 vs 10.8, $p = 0.586$).

Conclusion:
Sinus surgery in adults with CRS was associated with increased daily steps and vigorous activity, representing the first objective demonstration of postoperative functional improvement using wearable data. Continuous monitoring may help identify which patients benefit most and could be incorporated into future studies.

Poster# ARS158

Why septoplasty sometimes needs a revision: Looking at recent findings (2020–2025)

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Background:
Septoplasty is widely performed to improve nasal airflow, yet some patients continue to experience obstruction postoperatively. Recent studies (2020–2025) have investigated why primary septoplasty fails, focusing on overlooked structural and functional contributors.

Methods:
A review of case series, cohort studies, and systematic reports was conducted, emphasizing documented causes of persistent obstruction and reported revision techniques. Particular attention was given to caudal septal deviation, nasal valve dysfunction, and insufficient septal support.

Results:
Caudal septal deviation was the most frequently cited cause of failure, often due to incomplete correction or inadequate reinforcement. Additional issues included dorsal irregularities and unaddressed bone–cartilage junction problems. Nasal valve dysfunction was commonly missed preoperatively, leading to persistent congestion despite a straightened septum. Revision approaches typically involved spreader grafts, cartilage reshaping, or traction sutures; complex cases required more extensive reconstruction. Some studies noted that deviation morphology (C-shaped vs. S-shaped) influenced revision complexity and durability.

Conclusion:
Most revision septoplasties stem from persistent caudal deviation and unrecognized nasal valve collapse. Improved preoperative assessment and standardized characterization of septal patterns may reduce revision rates. Long-term success depends on addressing both structural alignment and nasal airflow mechanics.

Poster# ARS159

WITHDRAWN

Poster# ARS160

Wu-Tang middle turbinate resection classification

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Background:
Access for topical drug delivery to the sinus cavities via sinus irrigation is a fundamental goal of endoscopic sinus surgery (ESS). Middle turbinate resection (MTR) has previously been shown to affect the distribution of saline rinses, but the extent or types of MTR have not been codified, nor has the impact of MTR extent on saline rinse distribution been studied.

Methods:
Full ESS was performed on 8 cadaver heads. Each head was irrigated with fluorescein-dyed water using a squeeze bottle in three conditions: no MTR (Wu-Tang 0), partial MTR to the level of the roof of the maxillary sinus (Wu-Tang 1), and full MTR to the skull base (Wu-Tang 2). Videos were recorded using rigid nasal endoscopy, and the sinus cavities were irrigated until clear between applications. The videos were scored on the extent of staining (0 to 3) for each site: nasopharynx, maxillary sinus, sphenoid sinus, ethmoid sinus, and frontal sinus. ANOVA was used to compare the three different conditions for each sinonasal location.

Results:
ESS without MTR provided overall low staining of tissue in all locations, and generally low levels of staining in the frontal sinus were found in all conditions even with MTR. However, total MTR improved staining significantly in all locations compared to no MTR. Partial MTR significantly improved staining of the frontal sinus cavities compared to no MTR. Total MTR was significantly better than partial MTR in staining the nasopharynx, maxillary sinus, and sphenoid sinus.

Conclusion:
MTR improves saline distribution in operated sinonasal cavities. Standardized technique and nomenclature for the extent of MTR may also be important in future prospective studies to determine clinical relevance.

SAVE THE DATE 2026

Registration: https://cvent.me/7Be9vW **Housing:** Loews Miami Beach Hotel

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- Signature Event
- Symposia Sessions
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