



The 40th Annual
**BAY AREA
RESIDENTS'
RESEARCH
SYMPOSIUM**
in Otolaryngology —
Head & Neck Surgery

P R O G R A M

**Kaiser Permanente
Oakland, California**

May 10, 2024

THE 40th ANNUAL **BAY AREA RESIDENTS' RESEARCH SYMPOSIUM**

D I S T I N G U I S H E D F A C U L T Y



Joshua Levy, MD, MPH

*Clinical Director of Division of Intramural Research
National Institute of Deafness and Communication
Disorders (NIDCD)*

**Keynote Speaker
and Judge**

Dr. Levy joined the NIDCD as Clinical Director (CD) in April 2023. He focuses on establishing innovative clinical trials related to hearing, smell, and other communication disorders.

Previously, Dr. Levy served as Associate Professor and Associate Vice Chair of Research in the Department of Otolaryngology-Head & Neck Surgery at Emory University in Atlanta. He is a fellowship-trained rhinologist with a clinical and research focus on chronic sinusitis with nasal polyposis, a debilitating disease associated with marked loss of smell.

He completed his medical and public health training at Tulane University in New Orleans, where he also completed his residency in otolaryngology. Upon completing his residency in 2015, he joined Dr. Tim Smith for a fellowship in rhinology, sinus and skull base surgery at Oregon Health & Science University in Portland.

THE 40th ANNUAL BAY AREA RESIDENTS' RESEARCH SYMPOSIUM

D I S T I N G U I S H E D F A C U L T Y



Aditi Bhuskute, MD

*Assistant Professor
Department of Otolaryngology / Head & Neck Surgery
University of California Davis*

Judge



Yew Song Cheng, MD

*Otolaryngologist
Department of Otolaryngology / Head & Neck Surgery
University of California San Francisco*

Judge



Brian Nuyen, MD

*Laryngologist
Department of Otolaryngology / Head & Neck Surgery
Stanford University*

Judge



Daniel Sukato, MD

*Facial Plastic Surgery
Department of Otolaryngology / Head & Neck Surgery
Kaiser Permanente Oakland Medical Center*

Judge



Rijul Kshirsagar, MD

*Otolaryngologist
Department of Otolaryngology / Head & Neck Surgery
Kaiser Permanente Redwood City Medical Center*

Moderator



Christopher Xiao, MD

*Otolaryngologist
Santa Cruz Ear Nose and Throat Medical Group*

Moderator

THE 40th ANNUAL **BAY AREA RESIDENTS' RESEARCH SYMPOSIUM**

BARRS ORGANIZING COMMITTEE

Jonathan Liang, MD, MPH, *Chair*, Kaiser Permanente Oakland
Jolie Chang, MD, University of California San Francisco
Benjamin Malkin, MD, Kaiser Permanente Oakland
Kara Meister, MD, Stanford University
Toby Steele, MD, University of California Davis
Kevin Wang, MD, Kaiser Permanente Oakland
Noriko Yoshikawa, MD, Kaiser Permanente Oakland

OVERVIEW

The Bay Area Residents' Research Symposium (BARRS) provides a unique forum for otolaryngology residents to present their original research projects. A panel of respected otolaryngologists and the audience offer the residents constructive criticism on the design, validity, and presentation of their research. Clinicians, researchers, and residents benefit from the interactive discussion based on each presented topic.

SYMPOSIUM OBJECTIVES

By the conclusion of this symposium, attendees will be able to:

1. Critique the scientific validity of the presentations.
2. Summarize the elements of a clear, concise scientific presentation.
3. Describe at least three areas of cutting-edge research development in our specialty.

SYMPOSIUM OUTLINE

8:30 Registration

9:00 Welcome
BARRS Chair: Jonathan Liang, MD, MPH

9:05 Morning Introduction
Moderator: Rijul Kshirsagar, MD

9:10 **Peter Debbaneh, MD, Kaiser Permanente Oakland**
Diagnostic Yield of Neck Mass Imaging: Impact of Clinician Specialty (Clinical Study)

Background: While the AAO-Clinical Practice Guidelines for adult neck masses recommends a targeted history, physical exam, including the pharynx, base of tongue and larynx before formal imaging, it is unclear if the patient should be evaluated by HNS clinician prior to obtaining formal imaging. This study aims to fill that knowledge gap by investigating the diagnostic yield of formal neck imaging based on the specialty of the ordering clinician.

Methods: Retrospective chart review was conducted on a randomized cohort of patients within a multi-location HMO system who underwent neck imaging (CT, MRI, or US) for neck mass evaluation between 1/1/2021 and 12/31/2022. Imaging studies for suspected thyroid masses, surveillance of known masses, or incidental findings were excluded. A positive finding was defined as a relevant imaging finding corresponding to the area of suspicion noted by the ordering clinician or the skin marker placed by the radiology technician.

Results: A total of 213 patients were included, with an average age of 54.5, and 64.3% were female. Imaging was ordered by OHNS and non-OHNS clinicians 62 and 151 cases, respectively. CT was the most common study ordered (61.5%), followed by US (21.6%) and MRI (15.0%). Regarding workup prior to imaging, 172 patients (80.8%) had a physical exam, 15 (7.0%) had FNL, and 12 (5.6%) underwent POCUS. OHNS-ordered imaging had a higher diagnostic yield of 74.2% compared to non-OHNS diagnostic yield of 50.5% ($p < 0.001$). Diagnostic yield increased to 80.0% and 83.3% when FNL or POCUS was performed, respectively, and decreased to 42.4% without a physical exam. The overall rate of incidental findings was 17.8% with no significant difference based on specialty, and most commonly included thyroid nodules, lung nodules, and unrelated lymph nodes.

Conclusion: In the workup of adult neck mass, the majority of imaging was ordered by non-OHNS and associated with a lower diagnostic yield compared to tests ordered by OHNS. These findings support the AAO CPG guidelines for OHNS evaluation prior to formal neck imaging.

9:18

Alexandra Bourdillon, MD, University of California San Francisco

Leveraging Large Language Models for Extracting and Interpreting Head & Neck Cancer Pathology Reports (Clinical Study)

Background: Large language models (LLMs) such as Chat-GPT have ushered a new wave of generative artificial intelligence that bears distinct opportunities in conveying complex medical information to patients. Additionally, they offer incredible potential to extract and interpret large amounts of clinical data. Here we develop a novel methodology for integrating LLMs and compare that to traditional techniques using natural language processing (NLP).

Methods: Surgical pathology reports were extracted from 692 individuals with oral cavity cancers who underwent surgical resection including neck dissection.

Pathologic factors were extracted using two techniques: human verified outputs from a semi-automated NLP regular expression methodology, and data extraction using LLM-based Versa platform hosted by Azure OpenAI. Concordance was evaluated between each of the NLP and LLM methods and human-verified data.

Results: Numerous data points were extract across the pathology reports including: tumor location, tumor size, surgical margin status, number of nodes examined, number of positive nodes, maximum lymph node size, p16/HPV status, and other pathologic features. NLP methods faired similarly across many metrics, including tumor size, lymphovascular invasion, and perineural invasion, but for margin status (90.6%), number of lymph nodes examined (93.2%), and number of lymph nodes involved (92.1%) were outperformed by the LLM method (>95% for each).

Conclusion: LLM methods offer accurate and reliable data extraction techniques for parsing complex pathologic information that can benefit research efforts. Future work should seek to harness generative capabilities for improving patient access and education.

9:26

Jacquelyn Callander, MD, University of California San Francisco

In-clinic Endotyping: Measurement of Eosinophil Peroxidase Level as A Diagnostic Test of Eosinophilic Chronic Rhinosinusitis (Clinical Study)

Background: Practical biomarkers for endotypic characterization of chronic rhinosinusitis (CRS) remain elusive, hindering its clinical utility. Eosinophil peroxidase (EPX) is an enzyme released by activated eosinophils. The objective of this study was to evaluate a clinic EPX assay as a marker of eosinophilic CRS.

Methods: Subjects with and without CRS presenting to a tertiary care rhinology clinic were prospectively enrolled, and nasal cytology brushings were collected from the middle meatus during in-clinic nasal endoscopy. ELISA assay was used to quantify EPX level and a customized multiplex immunoassay was used to quantify inflammatory cytokine mediators. Findings were correlated with clinical data.

Results: 42 subjects were enrolled, including 31 CRS subjects and 11 controls. Median EPX levels were 125.0ng/ml (SD 1745.8) and 6.5ng/ml (SD 99.0) for CRS group and controls respectively (p=0.003). EPX levels were positively correlated with history of asthma (p= 0.015), allergies (p= 0.028), polyps (p= 0.0006), smell loss (p= 0.006), and systemic eosinophilia or elevated IgE (p= <0.0001). 28 subjects from both the CRS and control groups had prior pathology for comparison, with histologic confirmation of local tissue eosinophilia (>10 eos/hpf) in 11 subjects. This subgroup had a median

EPX level of 967.5ng/ml, compared to 10.6ng/ml in 17 subjects without local tissue eosinophilia (p= 0.0008). EPX levels were positively correlated to IL-5 levels (p= 0.0005).

Conclusion: EPX levels can be measured via well-tolerated in-clinic testing. EPX levels correlate to clinical markers of type 2 inflammation and tissue eosinophilia and may provide a valuable diagnostic tool to delineate eosinophilic CRS.

9:34 **Bryan Le, MD, Kaiser Permanente Oakland**

Delayed Toxic Shock Syndrome after Functional Endoscopic Sinus Surgery: A Case Report (Case Report/Series)

Introduction: Toxic shock syndrome (TSS) is a rare but serious condition characterized by systemic toxemia resulting from release of bacterial toxins, most commonly associated with *Staphylococcus aureus* and *Streptococcus pyogenes* infections. Even in the absence of an overt source of infection, TSS can progress rapidly and with severe consequences. Here, we present a unique case of TSS following functional endoscopic sinus surgery (FESS).

Case Presentation: A 32-year-old man with history of chronic rhinosinusitis with nasal polyps (CRSwNP) underwent bilateral full FESS. Appropriate post-surgical recovery noted during post-operative appointments. On post-operative day (POD) 36, patient presented to urgent care with fevers, nasal obstruction, generalized malaise, non-bloody diarrhea, and emesis. Examination was remarkable for fever, tachycardia, and intermittent confusion. Patient was sent to the emergency department (ED) for further evaluation and stabilization. ED course remarkable for development of a petechial rash over his left arm that would later spread diffusely, elevated white blood cell count (WBC), elevated lactate, and hyponatremia. CT imaging showed extensive opacification throughout all paranasal sinuses. Patient was admitted to medicine; however, was soon upgraded to the ICU due to persistent hypotension and elevated lactate levels. HNS scope evaluation revealed diffuse nasal crusting with notable white debris at the right middle meatus concerning for fungal growth. Patient was brought to the operating room for a more comprehensive debridement and sinus washout. On POD1, patient's hypotension, tachycardia, elevated lactate, and acidosis all resolved - resulting in a downgrade from the ICU. On POD3, patient had significant symptomatic improvement along with interval improvement of petechial rash and was subsequently discharged from the hospital.

Discussion: This case illustrates the potential for a delayed presentation of TSS after FESS. Although TSS is especially rare after FESS, its rapid progression and severity highlight the critical role of surgeon awareness in early recognition and intervention.

9:42 **Jackson King, MD, University of California Davis**

OpenNotes utilization and Electronic Health Record Portal Interactions Amongst Patients with Chronic Rhinosinusitis (Clinical Study)

Introduction: The 21st Century Cures Act mandates patient access and electronic viewability of physician notes. Improved transparency may facilitate patient-physician communication but also creates additional demands on physician schedules. This study evaluates the impact of the Cures Act on how patients with chronic rhinosinusitis (CRS) utilize access to physician notes.

Methods: Patients receiving a CRS diagnosis between November 2020 and June 2022 in an Academic rhinology clinic were included. Demographics, rural vs urban zip codes, electronic health record portal (EHRP) activation, and time to access note were recorded. Participants without an EHRP were recruited for study participation during clinic visits. Perceptions of open notes and their impact on care for patients with CRS were assessed through Qualtrics survey via the EHRP.

Results: Survey response rate was 23% (n=203) for CRS patients with EHRP access while 30 participants without portal access were enrolled. The median number of days between the clinical encounter and patients accessing their medical records was 2.61 days (IQR 0.86, 10.69). On average, patients read their notes 0.39 times (SD 1.05) with 82.95% of surveys reporting that they strongly agree that it is important to have access to their physician's notes. The majority of patients were categorized as reading their notes < 25% of the time (60.6% of total number of patients) while 9.66% read 100% of their notes. The mean number of documented patient messages and telephone encounters in the EHRP per provider in 2022 for a single rhinology practice was 900 and 445 respectively.

Conclusion: Since institution of the Cures Act, patients are now able to interact with and view EHRP clinical encounter notes which can facilitate physician-patient communication but can also impact time demand on physician schedules due to increased interaction with the EHRP.

9:50 Discussion/Q&A

10:00 **Rami Ezzibdeh, MD, Stanford University**

Functional Outcomes of Dual Nerve Transfer for Patients with Facial Paralysis (Clinical Study)

Patients with facial paralysis can experience high levels of depression and social isolation. Combined masseteric and hypoglossal to facial nerve transfers, also called dual nerve transfers (DNT), is a novel approach for facial reanimation. In this procedure, the proximal facial nerve is coapted to the hypoglossal nerve, while the masseteric nerve is then transferred to the buccal branch of the facial nerve.

We provide a single-institution, retrospective analysis for 8 patients who underwent DNT. Functional outcomes were quantified using the electronic clinician-graded facial function scale (eFACE). The disease-specific quality of life and impact on communication were measured using the Facial Clinimetric Evaluation scale (FaCE) and Communicative Participation Item Bank (CPIB) scores, respectively. The average denervation time was 13.6+/-5.4 months with a follow-up time of 12.4+/-3.9 months.

The results indicate an average postoperative composite eFACE score of 68+/-7 with an improvement of 25+/-7 points (p<0.001). Commissure movement increased 68+/-24 points (p<0.001). The postoperative dynamic and static domains were 49+/-11 and 79+/-6 with an increase of 39+/-10 and 38+/-18 points, respectively (p<0.01). The synkinesis score after reconstruction was 91+/-5 with a decrease of 9+/-6 points (p=0.002). The FaCE survey scores improved by 9.5+/-5.0, or about 26% (p<0.001). The communication survey score increased on average 5.1+/-6.6 points (p=0.06).

DNT offers significant improvement in clinician-scored facial function and patient reported, disease-specific quality of life, while also worsening facial synkinesis. Patients in this limited cohort show good functional outcomes even when the surgery is performed after 12 months of denervation time.

10:08

William Swift, MD, University of California Davis

Perioperative Intraocular Pressure Change in Orbital Fracture Repair (Clinical Study)

Introduction: Few studies have specifically investigated the extent to which orbital fracture repair influences intraocular pressure (IOP), and the existing research lacks consensus in its findings. Even in the absence of intraocular injury, significant changes in IOP can have detrimental effects and outcomes on vision. This study aims to further address whether a discernable shift in IOP during orbital fracture repair is present.

Methods: This is a prospective intervention study of nine patients undergoing orbital surgery at a single tertiary care hospital. IOP was measured with a Tono-Pen at five different time points: pre-operatively, intraoperatively immediately after anesthesia induction, immediately prior to intervention (e.g. implant placement, tumor removal), immediately following intervention, and prior to extubation. Statistical analysis was performed using paired t-tests, ANOVA and Spearman correlation coefficients.

Results: Nine patients, all undergoing repair of orbital floor fractures, were included in the study, 7 male and 2 female with an average age of 35.3 years. The mean IOP variation was 14.3 mmHg and average intraoperative time of 196 minutes (range of 49-307 minutes). There was a significant increase in mean IOP from pre-operative evaluation to immediately before implantation (12.7 mmHg to 22.8 mmHg; $p < 0.05$). While there was a noted decrease in mean IOP immediately after implantation, (21.5 mmHg to 18.6 mmHg) it did not rise to the level of significance.

Discussion: Overall, a significant increase in IOP was identified from prior to surgery to immediately prior to orbital implantation. Despite a reduction in orbital volume following orbital implant placement, an increase in IOP was not seen with instead a paradoxical mild decrease in IOP. This study is limited by the relatively small patient sample size and a larger cohort is necessary to determine if a significant association exists.

Conclusion: Orbital fracture repair surgery is associated with significant change in intraoperative IOP, however the exact pattern and mechanisms require remain uncertain and warrants further investigation.

10:16

Pauline Huynh, MD, Kaiser Permanente Oakland

Facial Feminization Surgery and Mental Health Resource Utilization: A Retrospective Chart Review within an Integrated Healthcare System (Clinical Study)

Objectives: The health burden and psychosocial sequelae that transgender and gender diverse (TGD) individuals experience have been well described. Gender-affirming surgeries (GAS), including facial feminization surgery (FFS), are procedures aiming to harmonize visual gender congruence, reduce dysphoria, and

relieve psychological distress. The goal of the proposed research project is to perform an economic evaluation of FFS on a healthcare system and TGD patients mental health resource utilization, focusing on the number of mental health associated clinical encounters.

Study Design: Retrospective database review

Methods: We retrospectively analyzed the effects of facial feminization surgery (FFS) performed in 2016-2017 on utilization of mental health services, including individual and group sessions, in a large integrated healthcare system. We compared average quarterly rates for 12-24 months before FFS with quarterly rates during 24 months of follow-up. Patients who did not have continuous coverage for at least 12 months before and 12 months after FFS were excluded.

Results: 64 FFS cases performed between 2016-2017, of which 47 cases (mean age 37.5 + 13.2 years, 68.1% White, 60.9% full FFS spanning all three facial thirds) were included. Wilcoxon matched-pairs signed-ranks tests comparing pre-FFS with post-FFS utilization rates showed statistically significant reductions in numbers of mental health associated visits, including individual and group sessions ($p < 0.05$). This reduction was first noted starting at the month of FFS, and deemed statistically significant starting the third quarter after FFS ($p < 0.05$ for subsequent quarters). 1 patient had a documented mental health crisis prior to FFS requiring hospital admission, and none following FFS.

Conclusion: To our knowledge, this endeavor is the first utilization study of specifically FFS conducted in the United States. FFS had a positive effect on both the utilization of mental health care services, with a reduction in the number of mental health associated visits within an integrated healthcare system.

10:24

Ketan Jain-Poster, MD, Kaiser Permanente Oakland

The Impact of Obesity on Postoperative Adverse Events for Facial Feminization Surgery (Clinical Study)

Introduction: Facial feminization surgery (FFS) describes feminizing procedures to treat gender dysphoria. Many plastic surgeons adhere to BMI cutoffs of 30 to 35 for breast and body surgery, citing that obesity has been associated with increased postoperative soft tissue infections, length of hospital admission, and wound complications. The relationship between body weight and adverse events for gender affirming surgery has not yet been described for FFS, though there are calls for a better understanding of risk profiling.

Methods: A retrospective chart review was conducted for 160 adult patients who underwent FFS at a single institution in 2022. Demographic data was recorded and patients were separated into BMI class via the World Health Organization classification system. Primary outcome measures of surgical complications and adverse events postoperatively until 90 days after surgery were analyzed.

Results: The most common adverse events were increased pain beyond standard regimen (9.38%), wound dehiscence (7.6%), and surgical site infection (6.25%). Obese patients (BMI>30) experienced the highest proportion of surgical site infections (7.9%) and wound dehiscence (10.5%) compared to those with a BMI of less than 25 at 5.8%, and 7.2% respectively. Extended hospital stay rates were similar between groups. Wound dehiscence was most commonly observed at the trichophytic scalp

incision for hairline advancement, brow lift, or frontal cranioplasty. Intraoral sites for mandibuloplasty were the most common sites for postoperative infection.

Conclusion: Though differences in complication rates vary for patients with obesity relative to those with normal BMI, the rate of adverse events for patients undergoing FFS remains low. Obesity may be associated with increased rates of surgical site infection and wound dehiscence, though incidence of these complications does not correlate with BMI class for FFS. BMI in itself should not preclude facial gender affirming surgery for transgender patients, and counseling for surgical risk should be individually tailored.

10:32

Nikolas Block-Wheeler, MD, Kaiser Permanente Oakland

The Effect of Feminizing Genioplasty on Chin Projection During Facial Feminization Surgery (Clinical Study)

Background: Feminizing genioplasty is commonly performed to narrow and/or shorten the chin. Little is known how the procedure affects the projection of the overlying soft tissue. Learning Objective: To understand the role feminizing genioplasty can have on chin projection. Study Objective: To characterize the effect of feminizing genioplasty on chin projection. Design Type: A retrospective case series and cohort design. Method: Adults undergoing feminizing genioplasty were identified at a single institution from 2018 to 2022. Pogonion projection was measured as the angle from the Frankfurt horizontal line to a line drawn through the pogonion and labiomental sulcus; a greater angle indicated greater pogonion projection relative to the labiomental sulcus. The measurement was obtained pre- and post-operatively. Univariate analysis was used to test the effect of the addition of a chin-pad binding suture. Results: A total of 22 patients were included. Eleven of these had a soft-tissue binding suture performed in addition to the feminizing genioplasty. Preoperatively, overall mean pogonion projection was 86.1 degrees (SD 9.7), and patients gained 10.7 degrees (SD 9.4) of projection postoperatively. Feminizing genioplasty alone increased projection by 11.3 degrees (SD 10.0), while addition of the soft-tissue binding stitch did not significantly increase projection. Conclusion: Narrowing and/or shortening the bony chin results in greater soft tissue projection at the pogonion. The addition of a soft-tissue binding suture does not significantly improve projection but functions to narrow the soft tissue pad. Understanding the effect of feminizing genioplasty on chin projection can help surgeons utilize it to their advantage.

10:40

Discussion/Q&A

10:50

Break

11:10

Keynote Speaker:

Joshua Levy, MD, MPH

AERD and Beyond: Emerging Opportunities for Research and Patient Care at the National Institutes of Health

12:10

Lunch/Break/Photos

1:30 Afternoon Introduction
Moderator: **Christopher Xiao, MD**

1:35 **Julien Azimzadeh, MD PhD, Stanford University**
Pulsed Infrared Light Stimulates the Cochlea by Generating Pressure Waves that Are Detected by Hair Cells (Basic Science)

Background: Cochlear stimulation with infrared (IR) light has been proposed as an alternative to electrical stimulation as it could provide better frequency resolution in next-generation cochlear implants. However, the mechanism and target of infrared cochlear stimulation are unknown. Some studies suggest that spiral ganglion neurons are directly stimulated by IR irradiation, making it useful for cochlear implants, but others suggest that hair cells are required, limiting its value in cochlear implantation. Here, we sought to identify the locus and mechanism of IR cochlear stimulation in a live mouse preparation.

Methods: We recorded cochlear action potentials in response to both sound and infrared pulses. Our surgical approach preserved hearing while permitting infrared irradiation of the cochlea with an optical fiber. Sound- and laser-evoked vibrations in the cochlear apex were recorded using a custom-built optical coherence tomography (OCT) system.

Results: We show that IR light does not generate a cochlear action potential (CAP) after ablation of cochlear hair cells in transgenic (Pou4f3^{DTR/DTR}) mice. Additionally, we find that if either the electrical driving force for hair bundle activation is reduced, or hair-cell-based amplification is inhibited, the response to IR light is abolished as well. Using OCT, we show that infrared pulses generate motion within the cochlea, and that this motion is amplified by outer hair cells (OHCs).

Conclusions: Our findings suggest that infrared light generates a mechanical response that is amplified by cochlear OHCs and detected by IHCs, and that spiral ganglion neurons are not directly stimulated by IR light. We conclude that infrared irradiation is unlikely to be a successful energy delivery method for future cochlear implants.

1:43 **Tina Munjal, MD, Stanford University**
Risk of Otologic Symptom Onset following mRNA COVID-19 Vaccination: An Institutional Cohort Study with High-Dimensionality Propensity Score Matching (Clinical Study)

The objective of this retrospective cohort study was to evaluate for the onset of otologic symptoms including hearing loss, sudden hearing loss, tinnitus, dizziness, vertigo, aural fullness, and otalgia in older individuals who received mRNA vaccination against SARS-CoV-2 relative to a control group who received influenza vaccination. A secondary objective was to assess these symptoms after excluding for a history of COVID-19 infection in a sensitivity analysis. The COVID vaccination cohort was generated from patients aged 50 and over with no prior otologic diagnoses who received mRNA vaccination against SARS-CoV-2 at Stanford. The pre-pandemic influenza cohort was generated from patients aged 50 and over who received influenza vaccination at Stanford. For the sensitivity analysis, a history of

COVID-19 was used as an exclusion factor from both cohorts. Rates of otologic symptoms as defined by ICD-9 and -10 codes were compared in the two cohorts with attention to high-dimensionality propensity score matching in the groups to control for comorbid medical conditions and clinical histories. The risks of sudden hearing loss and aural fullness were higher in the COVID vaccination cohort in the six months following vaccination, and these effects persisted when a history of COVID-19 was used as an exclusion factor. However, these results for the association of vaccine type with sudden hearing loss and aural fullness are not precise and do not allow for definitive conclusions. There were no differences in the risks of tinnitus, hearing loss and otalgia between the two cohorts. There were reduced risks of dizziness and vertigo in the mRNA cohort as compared to the influenza vaccination group. Further studies are required to elucidate the mechanism behind these associations. Such studies can explore the interplay between clinical history and mechanism of disease.

1:51

Bridget MacDonald, MD, University of California Davis

Bilateral Cochlear Implant Datalogging Device Utilization in Simultaneously vs Sequentially Implanted Children (Clinical Study)

Introduction: In pediatric patients who undergo bilateral cochlear implantation, questions remain regarding how simultaneous vs sequentially implanted patients utilize their device. This study examines CI device datalogging to analyze the hours per day of CI usage in sequential vs simultaneous bilaterally implanted children.

Methods: We included bilaterally implanted CI patients (<18 years) at our tertiary care center between 5/1/2018-7/6/2023. Patients were grouped as simultaneous vs sequential. Audiologic notes and device data were reviewed to extract average hours per day of CI usage at most recent audiology clinic visit.

Results: Of the 29 bilaterally implanted patients, 6 were sequential and 23 simultaneous. Mean age of surgery (or first surgery for sequential) was 2.1 years with no detected difference between groups (2.0 vs 2.2 years, $p=0.866$). Overall mean datalogging was 7.1 hours per. Within those sequentially implanted, each patient used their first implant the same or more than their second, but the average usage between first and second implant was not significantly different (11.7 vs 7.1 hours, $p=0.136$). The sequential group used their first implant more than simultaneous children implants averaged (11.7 vs 6.5 hours, $p=0.004$) but no difference in usage was detected between second sequential implant and simultaneous implants (7.1 vs 6.5 hours, $p=0.774$). The sequential group had greater overall daily usage (9.4 vs 6.5 hours, $p=0.038$), however, was also substantially older at the time of most recent visit (8.9 vs 3.7 years, $p<0.001$).

Conclusion: Datalogging provides a potentially underutilized means to understand patients' practical usage of CI. Here, sequentially implanted patients showed greater daily usage, particularly of their first implanted ear. However, these children were older at time of datalogging measurement and age may play a role in ability to wear the device. Further examination of longitudinal audiologic datalogging is indicated for future study.

1:59

Alanna Coughran, MD, Stanford University

Prevalence of Cochlear Nerve Deficiency in Pediatric Single-Sided Deafness (Clinical Study)

Background: Management of pediatric single-sided deafness (SSD) has evolved following the 2019 US FDA initial approval of cochlear implantation for children with SSD ages 5+ years. This study examines the prevalence of cochlear nerve deficiency (CND; i.e., hypoplasia or aplasia) in a large clinical cohort of children with SSD.

Methods: A retrospective chart review was conducted at a pediatric tertiary care center for 190 children ages 0-21 years with SSD who underwent computed tomography (CT) or magnetic resonance imaging (MRI). Diagnostic criteria for SSD included unilateral severe-to-profound sensorineural hearing loss with normal hearing in the other ear. Diagnostic criteria for CND included neuroradiologist report of an aplastic or hypoplastic nerve on MRI or a narrow internal auditory canal and/or stenotic cochlear aperture on CT.

Results: Of the 78 children with MRI, 77% were found to have CND in the ear with SSD. This prevalence was 45% for the 82 children with CT and 63% for the 30 children with both MRI and CT. There was a 90% concordance across imaging studies.

Discussion: There is a high prevalence of CND in children with SSD and the use of CT in children with SSD may underestimate the prevalence of CND.

Conclusion: Cochlear nerve presence should be confirmed via MRI when determining CI candidacy. Clinicians should adapt patient counseling and expectations prior to imaging to reflect the high prevalence of CND in children with SSD.

2:07

Taylor Erickson, MD, University of California San Francisco

Cost Analysis of High Signal Approach in Otolaryngology-Head and Neck Surgery Residency (Clinical Study)

Objective: The objective of this study is to analyze a high-signal approach for otolaryngology-head and neck surgery (OHNS) residency applicants and calculate cost savings for programs and applicants.

Methods: Data from both the 2022-2024 Electronic Residency Application Service (ERAS) and a data model were used to demonstrate cost savings with a high-signal approach. Modeled data assumed that the number of applications per applicant would be equal to the number of signals allowed. Predicted and real-world cost savings across the five other specialties participating in a high-signal approach were calculated.

Results: ERAS data cost savings for the entire OHNS applicant pool amounted to \$365,950. In the modeled data, cost savings amounted to \$825,921. When extrapolated to include all five high-signal specialties, total cost savings amounted to \$2,570,464 (ERAS data) and \$6,359,478 (modeled data). Otolaryngology programs were predicted to experience significant time savings, resulting in cost savings of \$437,883 and \$1,113,342 for ERAS data and modeled data, respectively.

Conclusions: The study highlights advantages of a high-signal approach, including financial advantages or increased time for programs to engage in holistic review and diversify the pool of interview candidates. Cost savings in this study was shown to be significant when extrapolated across all specialties using a high-signal approach. Further research is needed to optimize the signaling system and confirm the favorable interview distribution and equity data from the low-signal OHNS experience with a high-signal approach.

2:15 Discussion/Q&A

2:25 **Patrick Kiessling, MD, Stanford University**

Fine Particulate Matter (PM 2.5) Burden from Wildfires and Pediatric Emergency Department Presentations for Acute Upper Airway Pathology (Clinical Study)

Introduction: Fine particulate matter (PM 2.5) is generated as a component of wildfire smoke, with an increasing impact on air quality as wildfires worldwide increase in severity, size, duration, and frequency. Though the negative health effects of PM 2.5 on the pediatric lower airway are well-established, including the development and exacerbation of asthma, the effects of PM 2.5 on the pediatric upper airway are not well understood.

Methods: A retrospective cohort study was conducted, assessing pediatric patient presentations from 2013-2023 to a pediatric emergency department in Northern California during periods of elevated PM 2.5 burden associated with nearby wildfires. Patients presenting during these wildfire periods were identified as either presenting with or without upper respiratory pathology, including tonsillitis, epiglottitis, pharyngitis, and laryngitis. Matched controls were also assessed, established as occurring exactly 1 year prior to each exposure period, with confirmed normal air quality during these control periods. Additionally, periods of 1 week post-wildfire were analyzed, along with year-prior matched controls. Chi-squared analyses were conducted to determine significance.

Results: Over the past 10 years, during periods of increased wildfire-generated PM 2.5 burden, a significantly greater proportion of pediatric patients presented to the emergency department with upper airway pathology compared to matched controls during periods of healthy air quality ($p < 0.05$). No significant differences were seen in proportions of children presenting during the week following wildfire smoke exposure periods when compared to controls, suggesting that PM 2.5 induces upper airway symptoms acutely rather than subacutely.

Conclusions: The clinical effects of wildfire-generated PM 2.5 exposures in children continue to be revealed, and appear to manifest as upper airway pathology in the acute exposure setting, clearly warranting further investigation.

2:33 **Tania Benjamin, MD, University of California San Francisco**

Sex Differences in Obstructive Patterns on Drug Induced Sleep Endoscopy (Clinical Study)

Introduction: Obstructive sleep apnea (OSA) affects over thirty-five million Americans. Drug induced sleep endoscopy (DISE) offers an anatomic assessment of

upper airway obstruction for patients with OSA. Sex differences, specifically findings in women with OSA, in DISE patterns are poorly defined.

Methods: A retrospective cohort study at a single tertiary care institution was performed from 2020 to 2023. All adult patients who underwent a DISE were included in this study. Demographics, sleep study findings, DISE findings, and sleep apnea treatments were collected. Univariate and multivariate analyses were used to compare patient demographics and clinical characteristics.

Results: 117 patients who underwent DISE were included, including 21% women (N= 35). The average age was 54.7 years (SD 15.2). Mean BMI was 28.6 kg/m² (SD 4.1). The mean apnea-hypopnea index (AHI) was 32.3 events per hour (SD 21.3). Most patients had severe AHI (48.7%), followed by moderate AHI (30.8%). On DISE, a significantly lower proportion of women demonstrated complete oropharyngeal lateral wall obstruction (25.7% women vs. 51.2% men, p=0.008). Multivariate analysis with sex, BMI, AHI, and prior surgery revealed that male sex was independently associated with complete collapse of the oropharynx (OR 2.55, 95% CI [0.005 - 1.868], p=0.048) but not other levels. Higher BMI and lack of prior tonsil surgery were associated with any collapse (partial or complete) of the oropharynx (OR 1.30, 95% CI [0.131 - 0.392], p < 0.001). BMI was also associated with any collapse at the tongue and epiglottis.

Discussion/Conclusion: This study demonstrates that fewer women have complete oropharyngeal lateral wall obstruction even when controlling for BMI and AHI. Sex differences in upper airway obstruction have implications in surgical outcomes after surgery for OSA. Additional studies are needed to better understand this difference in physiology between the sexes.

2:41

Jacob Hoerter, MD, Kaiser Permanente Oakland

Differences in Patient Secure Message Volume Among Otolaryngologists: A Retrospective Cohort Study (Clinical Study)

Objective: To identify differences in inbox and secure message burden among otolaryngologists based on demographics and subspecialty over four years.

Methods: Inbox data were queried from January 2019 until December 2022.

Otolaryngologists were categorized into cohorts by area of practice and gender. All inbox tasks, secure messages, and clinical encounters were collected and compared by gender, practice type, and years in practice. Means were compared using t-tests and chi-squared tests.

Results: Of the 128 physicians, 45.7% were comprehensive otolaryngologists and 61.3% were male. The most common subspecialties were facial plastics (15.6%), oncology (8.6%), and otology (7.8%). Otolaryngologists had an average of 143.5 inbox tasks per month, with 97.2 (67.7%) of them being secure messages, resulting in an average of 1.14 inbox tasks and 0.80 secure messages per clinical encounter. The ratio of secure messages per clinical encounter was consistent across all specialties except oncology (1.10, p=0.003). Otology (0.86, p= 0.032) and facial plastics (0.95, p=0.028) had significantly lower ratios of inbox tasks to clinical encounters when compared to their colleagues, while oncology had a higher ratio (1.70, p<0.001). No significant differences in inbox burden were observed between genders, years in

practice, or languages spoken. Secure messages steadily increased over the study period.

Conclusion: Inbox burden for otolaryngologists primarily stems from patient secure messages and varies across subspecialties. Considerations should be made to the inbox burden of head and neck oncologists. The implementation of support systems for inbox management could improve the imbalance between clinical and non-clinical responsibilities in otolaryngology.

2:49

Samuel Collazo, MD, Kaiser Permanente Oakland

The Association between Nasal Septal Deviation, Mean Pulmonary Artery Pressure, and Pulmonary Artery Systolic Pressure – a Scoping Review

Nasal septal deviation (NSD) is a common cause of upper airway obstruction, and surgical correction via septoplasty results in subjective and objective improvements in airflow. Multiple studies have been conducted to assess possible relationships between NSD and pulmonary artery pressures. The objective of this review is to identify the current evidence and examine how research is being conducted on the topic of the potential relationship between NSD, mean pulmonary artery pressure (mPAP), and pulmonary artery systolic pressure (PASP) in patients who undergo septoplasty. A scoping review was performed using the PubMed, EMBASE, and Ovid databases, in accordance with the PRISMA Extension for Scoping Reviews guidelines. Two independent reviewers screened 411 articles, and ultimately 9 case-control studies met eligibility criteria for review inclusion. There was a total of 458 study participants, of which 395 underwent septoplasty for NSD and 63 were matched controls who did not have NSD and did not undergo septoplasty. All studies reported a statistically significant difference in pre- and post-operative mPAP and/or PASP ($p < 0.05$). Additionally, the two studies that included matched controls reported a statistically significant difference between the pre-operative mPAP of patients with nasal septal deviations and the control participants ($p < 0.001$). These findings support the hypothesis that there is an association between NSD, mPAP, and PASP in patients who undergo septoplasty. Further studies are needed to assess for a cause-and-effect relationship between septoplasty for NSD and reductions in mPAP and PASP.

2:57

Elias Saba, MD, Kaiser Permanente Oakland

The Impact of Adenotonsillectomy on Healthcare Utilization in Children with Obstructive Sleep Apnea: Experience of an Integrated Medical Model (Clinical Study)

Background: Children with obstructive sleep apnea (OSA) exhibit increased healthcare utilization patterns in comparison to matched controls. The aim of this retrospective cohort study is to assess the effects of adenotonsillectomy (AT) on healthcare utilization levels among children with OSA.

Methods: Retrospective analysis was performed of children aged 3-12 diagnosed with OSA via polysomnogram (PSG) between 12/2016 and 02/2019. Healthcare utilization data were assessed for 12 months prior to PSG, and for 12 months after PSG (or after AT, delayed for the first 30 days after surgery to account for surgery-related visits). Variables assessed included number of

outpatient/inpatient/emergency visits; visits associated with upper respiratory infection (URI), otitis media (OM), or allergic rhinitis (AR); prescription data involving intranasal steroids or leukotriene receptor antagonists(LTRA); and communication data such as secure message load and specialty referrals. Linear difference-in-difference(D-I-D) models were used to assess the causal impact of AT on healthcare utilization outcomes.

Results: Analysis elicited 577 children with OSA, of whom 241(41.8%) underwent AT. The treatment group had significantly higher baseline inpatient/ED visits and OM visits in comparison to the observation group. Post-treatment analysis showed a significantly larger reduction in outpatient visits, secure messages, specialty referrals, and the use of intranasal steroid and LTRA in the treatment group compared to the observation group.

Stratification based on severity showed that the significant differences in healthcare utilization attributed to surgical treatment were primarily driven by the severe OSA group, which showed significant reductions in most variables. Alternatively, the only significant utilization reductions among treated children with mild OSA were in AR visits, intranasal steroid use, and LTRA use.

Discussion/Conclusion: This study represents the largest available study assessing the impact of AT on healthcare utilization in children with OSA that also considers the effect of OSA severity on utilization patterns. AT appears to decrease healthcare utilization patterns, particularly in children with severe OSA.

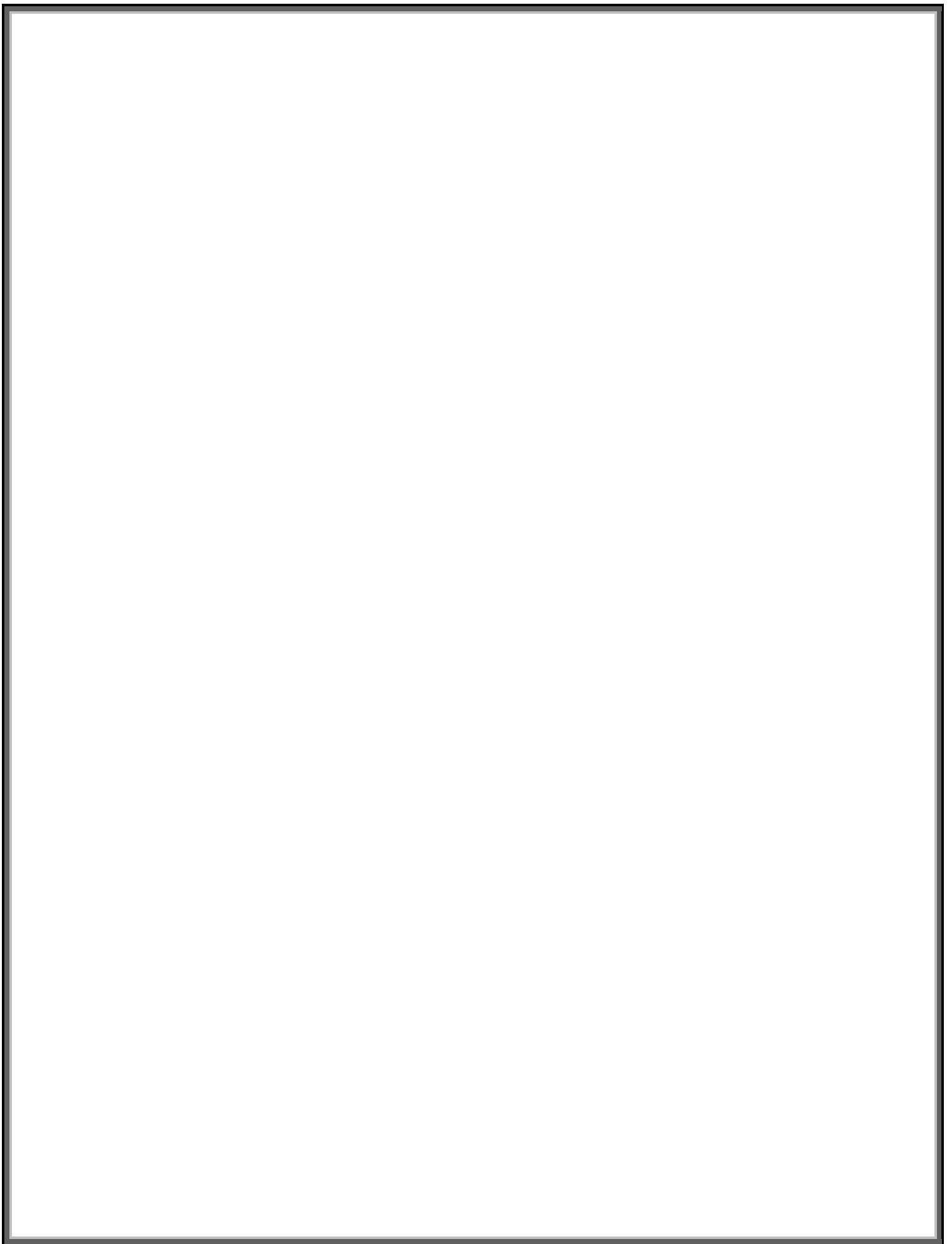
3:07 Discussion/Q&A

3:17 Conclusion

3:30 Reception/Awards Announcement

Fuji Summer Japanese Restaurant

3858 Piedmont Ave, Oakland, CA (5 min walk from medical center)



THANK YOU

*To the residents for their hard work.
To the guest speaker and moderators for their support.
And to the program directors, research mentors & faculty
for their continued commitment to resident education.*

PLEASE SAVE THE DATE

*The 41th Annual Bay Area Residents' Research Symposium in
Otolaryngology—Head & Neck Surgery*

Friday, May 9, 2025

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