The 41st Annual

BAY AREA RESIDENTS' RESEARCH SYMPOSIUM

in Otolaryngology—
Head & Neck Surgery

P R O G R A M

Kaiser Permanente
Oakland, California

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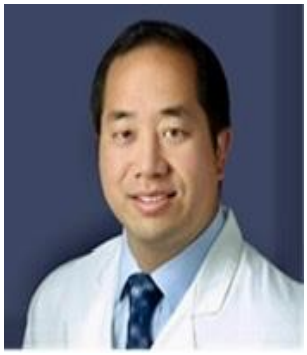
DISTINGUISHED FACULTY



Michael Hoa, MD

Professor in the Department of Otolaryngology at Georgetown University School of Medicine

Keynote Speaker and Judge

Dr. Hoa is a Professor in the Department of Otolaryngology at Georgetown University School of Medicine and is board certified in otolaryngology-head and neck surgery, otology, and neurotology. He serves as the Medical Director of the MedStar Georgetown University Hospital Cochlear Implant Program, providing comprehensive cochlear implant services to both pediatric and adult patients.

In addition to his clinical leadership, Dr. Hoa is a surgeon-scientist in the intramural research program at the National Institute on Deafness and Other Communication Disorders (NIDCD) at the National Institutes of Health (NIH). He also works with the Veterans Administration, further extending his commitment to improving hearing outcomes across diverse patient populations.

Dr. Hoa is the Chair of the American Cochlear Implant (ACI) Alliance Research Committee and an active State Champion for advocacy, promoting awareness and access to cochlear implant technology. He was recently promoted to full professor at Georgetown University, recognizing his contributions to both clinical care and research.

THE 41st ANNUAL BAY AREA RESIDENTS' RESEARCH SYMPOSIUM

Erynne Faucett, MD

Department of Otolaryngology/ Head & Neck Surgery
University of California Davis

Judge

Jake Lee, MD

Department of Otolaryngology /Head & Neck Surgery
Stanford University

Judge

Caroline Schlocker, MD

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

Judge

Cullen Taylor, MD

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

Judge

Caitlin Pacheco, MD

Department of Head & Neck Surgery
Kaiser Permanente Santa Clara Medical Center

Moderator

Cassandra Puccinelli, MD

Department of Head & Neck Surgery
Kaiser Permanente Oakland Medical Center

Moderator

THE 41st 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. A panel of esteemed otolaryngologists, along with the audience, provides constructive criticism on each project's design, validity, and presentation. The symposium fosters meaningful dialogue that benefits clinicians, researchers, and residents alike.

SYMPOSIUM OBJECTIVES

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

1. Evaluate the scientific validity of the research presentations.
2. Identify the key components of a clear and concise scientific presentation.
3. Describe at least three current areas of innovative research in the field of otolaryngology-head and neck surgery.

SYMPOSIUM OUTLINE

8:30 Registration

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

9:05 Morning Introduction
Moderator: **Caitlin Pacheco, MD**

9:10 **Samuel Collazo, MD, Kaiser Permanente Oakland**
***Topical Tetracaine for Adult Post-Tonsillectomy Pain* (Clinical Study)**
Background: Optimal pain management following adult tonsillectomy remains challenging. Topical anesthesia with a non-narcotic medication for local oropharyngeal pain control, such as 2% tetracaine, could serve as a component of multimodal analgesia. The primary aim of this project is to assess the effectiveness of topical tetracaine in reducing post-tonsillectomy pain scores. The secondary aim is to compare the rates of post-operative opioid use between the study groups.
Methods: A validated online survey was sent to adult post-tonsillectomy patients as part of standard of care within 1 week of the surgery. The study groups were composed of patients who used topical tetracaine lollipops for post-operative pain control (experimental) and patients who did not (control). Data collection includes patient demographics, surgical indication, pain scores, quality of life parameters, and post-operative opioid use. Based on power analysis calculations, at least 16 patients in each group will be required for statistical analysis. Mann-Whitney U test and Fisher's exact test will be used to compare outcome parameters between groups.
Results: Preliminary analysis of survey responses between March 2024 and December 2024 was performed. 22 patients completed the survey in this timeframe: 4 from the experimental group and 18 from the control group. Comparison of pain scores and post-operative opioid use did not reach statistical significance (p value > 0.05).
Discussion: The main limitation of this preliminary analysis is the small sample size in the experimental group. Final analysis of the effectiveness of topical tetracaine in reducing post-tonsillectomy pain scores and opioid use will be performed once adequate sample size in each study group is achieved.

9:17 **Nicholas Del Mundo, MD, Kaiser Permanente Oakland**
***Sucralfate for Post-Tonsillectomy Pain: Meta-Analysis* (Systematic Review)**
Background: Tonsillectomy is one of the most commonly performed procedures in otolaryngology–head and neck surgery. Postoperative pain is a significant contributor to morbidity and affects all patients to some degree. Various modalities

have been investigated to manage postoperative pain following tonsillectomy. This study aims to review and analyze current evidence on the use of sucralfate for reducing postoperative pain.
Methods: A systematic review and meta-analysis were conducted on randomized controlled trials assessing the effect of postoperative sucralfate on post-tonsillectomy pain. Relevant literature was sourced from the PubMed and EMBASE databases. Two authors independently reviewed the articles for inclusion and assessed their quality.
Results: After the removal of duplicates, 34 studies were identified in the initial search. Eight studies met the criteria for qualitative review, and three were included in the meta-analysis. Sucralfate was associated with a reduction in post-tonsillectomy pain on postoperative day 1 (-0.93, 95% CI: -1.22 to -0.63) and days 5–7 (-0.41, 95% CI: -0.69 to -0.13). The meta-analysis found no significant differences in secondary outcomes, including postoperative bleeding or nausea.
Discussion: Sucralfate reduces post-tonsillectomy pain when used as an adjunct to traditional pain management regimens, without increasing the risk of common postoperative complications such as bleeding or nausea. Current literature on this topic is limited and its overall generalizability is unclear.
Conclusion: Sucralfate shows promise as an adjunctive treatment for reducing post-tonsillectomy pain, but further studies are needed to confirm its clinical applicability.

9:24 **Isabella Leon, MD, University of California Davis**
Impact of Sociodemographic Disparities on Cochlear Implantation Wear-Time in a Single Institution Pediatric Cohort **(Clinical Study)**
Background: Cochlear implantation significantly improves auditory perception and speech intelligibility of children suffering from profound sensorineural hearing loss. However, access to and utilization of such devices is neither uniform nor equitable. While variations in pediatric CI outcomes are influenced by innate biological differences, preoperative language ability, and age of implantation, a wide array of social, environmental, and economic factors, often at a neighborhood level, significantly impact optimal outcomes. The CDC created the social vulnerability index (or SVI), as a holistic measure that encompasses a patients social determinant of health contributing to health care disparities. The SVI characterizes neighborhood vulnerability by using a national percentile-ranked score that ranges from 0 to 1, with scores greater than 0.5 indicating higher levels of area-level deprivation. As a result, SVI is a composite indicator of how a community affects a patient's daily life.
Objective: To collect and analyze outcomes in children undergoing cochlear implant (CI) surgery at UC Davis Children's Hospital. We aim to discuss how social vulnerability index in NorCal may affect aural habilitation outcomes in the context of pediatric cochlear implantation wear time. Our hypothesis is that Children with increased clinical complexity and social vulnerability will have poorer outcomes compared to those without. We predict that social vulnerability increases the

likelihood a child will inconsistently use his or her CI device, and thus have poorer speech perception performance. Our research will help determine areas of improvement for bolstering outcomes and increasing access to cochlear implantation for children in our area.
Methods: This single-center retrospective cohort study included Cochlear implants performed on children between August 2019 and November 2024. Geographic information was used to assign census-tract level social vulnerability index (SVI) scores to each patient. Categorical data including SVI quartile and demographic variables were investigated using pearson chi square test and odds ratios to determine their impact on wear time.
Results: 55 patients met our inclusion criteria. Controlling for age, gender, race, insurance status, communication means, language spoken at home, patients with high overall SVI were significantly more likely to have low wear time (<8 hours/day) (odds ratio [OR] 6.6, 95% confidence interval [CI] 1.22-35.4). The same was found for patients of the high SVI socioeconomic subgroup (odds ratio [OR] 9.16, 95% confidence [CI] 2.73-30.43). Patients with socioeconomic vulnerability had significantly lower wear time (<8 hours ($p = 0.01$)). High racial vulnerability seemed to have the reverse effect.
Discussion: Studies looking at pediatric CI usage have found fewer hours of daily device use result in poorer speech, language, and hearing outcomes. These findings support the importance of consistent device use in fostering adequate and appropriate listening and spoken language skills in children with hearing loss using auditory technology. The CDC created the SVI as a holistic measure that encompasses a patients social determinant of health contributing to health care disparities. It can be deducted that social vulnerability in Northern California, particularly socioeconomic vulnerability, increases the likelihood a child will inconsistently use a CI device, and thus have poorer speech perception performance. Understanding the full impact of a childs community on their health status may provide clinicians with a more comprehensive understanding of clinical outcomes in CI aural habilitation.

9:31 **Ana Marija Sola, MD, University of San Francisco**
***Pre-Implant Vocalizations Predict Post-Implant Language Development in Deaf Children* (Clinical Study)**
Background: Speech and language developmental assessments are crucial adjuncts to audiologic data for the care of infants and toddlers with hearing loss. However, these assessment tools are prone to bias, time-intensive and do not capture at-home child behaviors which may be most reflective of their actual development.
Methods: This was a prospective, multicenter cohort study. Eighteen children with predominantly severe-to-profound sensorineural hearing loss who underwent unilateral or bilateral cochlear implantation before 3 years of age were included. Data were collected via wearable recorders that measured child vocalizations and caregiver-child interactions in the home pre-implantation. Post-CI in-clinic

language assessments were administered in line with clinical guidelines at approximately 6 months intervals for an average time-period of 17.8 months.
Outcomes: Main outcomes of interest were receptive and expressive spoken language skills assessed using the Auditory Comprehension, Expressive Language and Total Language Score of the Preschool Language Scales-5th edition (PLS-5).
Results: Pre-implantation, standard scores for quantity of child vocalizations and conversational turns ranged from 79.2-126.4 and 77.8-137.2, respectively, demonstrating behaviors comparable to typically hearing babies. After controlling for demographic factors, CI use (hours/day), best pre-implantation pure tone average thresholds (PTA) and age of implantation, every standard deviation increase in caregiver-child interaction standard score, was associated with a 4.88 point increase in auditory comprehension standard score (B: 0.20, 95% CI: 0.04 to 0.36, R^2=0.83. p=0.013) and 4.68 point increase in total language score (B: 0.22, 95% CI: 0.04 to 0.40, R^2=0.78, p=0.02).
Conclusion: Children with severe-profound SNHL produce speech-like vocalizations and engage in vocal conversational turn-taking even before CI. While the quantity of these vocal behaviors pre-CI did not, the degree of interactions with caregivers did strongly predict language outcomes after CI. These associations persist even after controlling for multiple demographic and clinical factors, with moderate effect sizes. Wearable, home-based assessments may aid in identification of children who are at higher risk of poorer language outcomes following CI and help inform future comparative effectiveness studies for targeted interventions addressing parent-child speech and overall sound environment.

9:38 **Henry Zheng, MD, Kaiser Permanente Oakland**
Digital versus Traditional Otoscopy in the Pediatric Primary Care Clinic
(Clinical Study)
Objectives: Our objective was to assess whether the use of digital otoscopy versus traditional otoscopy in a pediatric clinic setting leads to decreased rates of antibiotic prescriptions and follow-up visits. Secondary outcomes included photo viability and both patient and provider satisfaction.
Methods: This was a prospective study in which both digital otoscopes and traditional otoscopes were deployed at two different pediatric offices during an eight-week pilot period. The treatment group consisted of patients who received ear exams with digital otoscopy while the control group consisted of patients who received ear exams with traditional otoscopy. Measured outcomes included rates of antibiotic prescription and follow-up visits, photo viability, and both patient and provider satisfaction.
Results: Comparing the treatment group with the control group, the average number of visits per patient decreased by 0.14 from 1.14 to 1.0, (p = 0.007). The number of antibiotic prescriptions per patient decreased by 0.31 from 0.88 to 0.57 (p = 0.0008). The overall experience with digital otoscopy was rated as good or excellent in 94% (16/17) of patients. Seventy-three percent (8/11) of providers rated the digital otoscope as excellent or good compared to traditional otoscopes, and

82% (9/11) stated that they were extremely likely or likely to continue using the digital otoscope in their practice.
Conclusion: The use of digital otoscopy versus traditional otoscopy in a pediatric clinic setting was associated with significant decreases in follow-up visit volumes as well antibiotic prescriptions. Implementing digital otoscopy more widely may contribute to decreased healthcare utilization costs and improved antibiotic stewardship for AOM.

9:45 Discussion/Q&A

10:05 **Bryan Le, MD, Kaiser Permanente Oakland**
***Risk of No Residual Disease from Head and Neck BCC Excisions following Shave Biopsy* (Clinical Study)**
Introduction: To investigate the risk of and factors associated with no residual disease in basal cell carcinoma (BCC) wide local excisions (WLE) performed following an initial shave biopsy.
Methods: This is a retrospective cohort study of patients in an integrated health system referred from dermatology to otolaryngology - head and neck surgery. Medical records of adults with shave biopsy-confirmed BCC referred for WLE between January 2022 and December 2023 were reviewed. Data collection included patient demographics, biopsy results, pre-procedure photographs uploaded to the electronic medical record, and relevant medical history. Univariate analysis was performed using chi-square tests, and multivariate logistic regression was conducted to assess the association between patient factors and outcomes.
Results: Among 243 cases, 27.2% (N=66) had no residual disease. Patients with no residual disease were younger on average compared to those with residual cancer (65.44 ± 14.16 years vs. 72.62 ± 12.95 years, $p< 0.001$). Of the 97 female cases, 40.2% (N=39) had no residual disease. Multivariate analysis revealed significant associations with gender: females were more likely to have no residual disease (OR 3.308, 95% CI 1.800-6.476, $p< 0.001$). No significant differences were observed based on comorbidities such as diabetes mellitus (DM), prior radiation history, or transplant history. Histologic subtypes showed no significant associations with residual disease status ($p>0.05$ for all subtypes).
Conclusions: This study highlights that gender and age are significant predictors of residual disease status in BCC patients undergoing WLE, while histologic subtype and comorbidities do not show significant associations. These findings may help guide pre-operative decision-making and counseling, particularly in balancing the potential morbidity of unnecessary procedures in cosmetically sensitive areas or in patients with limited life expectancy. Future research should focus on integrating these predictors into risk stratification models to minimize overtreatment.

10:12 **Alexandra Bourdillon, MD, University of San Francisco**

Semi-Automated Histopathologic Biomarkers for Predicting Malignant Transformation in Oral Epithelial Dysplasia **(Basic Science)**

Background: Oral epithelial dysplasia (OED) comprises a wide variety of precancerous phenotypes that can be challenging to manage and surveil. Malignant transformation is difficult to predict but is informed by ever-growing understanding of the tumor microenvironment and infiltrating immune cells that modulate immune surveillance evasion and cancer progression. Our aim is to identify histopathologic markers for early malignant transformation.

Methods: We curated a dataset of 16 distinct individuals with OED who were followed longitudinally (ranging 5-11 years) and underwent multiple biopsies. Tissue Microarrays were prepared from 2mm cores and whole slide imaging was analyzed using QuPath to delineate 30 Âµm margins of neighboring dysplasia and immune compartments. Automated pathways were conducted for cell detection as well as nuclear and cytoplasmic features, which were compared across the cohort of fast-progressors (malignant transformation within 3 years) and slow-progressors.

Results: Differences in cell density ratio (dysplasia versus immune compartment) was not significantly correlated with dysplasia severity ($p=0.672$), but was associated with fast-progressors ($p =0.051$). Multivariate regression demonstrated that distributions of nuclear/cellular area and circularity were significantly correlated with dysplasia ($p<0.01$).

Discussion: Cell density ratio is correlated with malignant transformation in OED and is independent of dysplasia staging. Further studies are needed to interrogate these features in a larger cohort or identify specific immune targets to inform therapeutic interventions.

Conclusion: H&E staining may offer valuable biomarkers to inform risk of malignant transformation that can guide surveillance strategies and management of OED.

10:19 **Maxwell Lee, MD, Stanford University**

Impact of Beers Criteria Medications in Elderly Patients with Head and Neck Cancer **(Clinical Study)**

Introduction: The Beers Criteria identify potentially inappropriate medications for adults aged 65 and older, who face higher risks of adverse drug events. Elderly head and neck cancer (HNC) patients often have multiple comorbidities and high polypharmacy, yet the impact of these medications on their outcomes is not well understood. We hypothesized that increased use of Beers Criteria Medications to Avoid (BCM) would be linked to worse outcomes in this population.

Methods: We conducted a retrospective cohort study using SEER-Medicare data for patients â‰¥65 years diagnosed with HNC from 2011 to 2015. We included 2023 Beers Criteria Medications to Avoid with moderate-quality evidence and strong recommendation in gastrointestinal (GI), pain, central nervous system (CNS), and antihistamine categories, excluding meds allowed for specific indications.

Medications had to be used for â‰¥10 days within one year post-diagnosis; patients who survived <1 year were excluded.
Results: Among 5,349 patients (mean age 72.6, SD 9.2; 33.0% female), 43.9% received no BCM, 41.4% received one, 9.3% received two, and 5.4% received three or more. The most common BCM categories were CNS (33.0%) and pain (23.9%), with Lorazepam, Alprazolam, and Zolpidem most prevalent. Two-year overall survival was 88.2% for no BCM, 86.8% for one, 86.7% for two, and 81.4% for three or more ($p<0.001$). Patients receiving â‰¥1 BCM were younger (71.4 vs 74.0 years, $p<0.001$), more likely to be female (36.7% vs 28.3%, $p<0.001$), to receive chemotherapy (39.3% vs 32.6%, $p<0.001$) or radiation (61.9% vs 56.1%, $p<0.001$), and to have more emergency department claims (1.21 vs 0.97, $p=0.004$).
Discussion/Conclusions: Over half of elderly HNC patients received at least one BCM, and 5.4% received three or more. Greater prescription of these medications was associated with lower survival and higher ED use. Strategies to minimize these medications in older HNC patients warrant further investigation.

10:26 **Pauline Huynh, MD, Kaiser Permanente Oakland**
Utilization Patterns of Vocal Cord Injection and Thyroplasty Procedures from 2012 to 2022 in the Medicare Population **(Clinical Study)**
Background: Vocal cord injection and augmentation have grown increasingly popular in the management of laryngeal disorders and can be done in a variety of practice settings. In 2017, the Healthcare Common Procedure Coding System (HCPCS) was updated to further specify laryngeal procedures and improve reimbursement for injection materials. How these codes have affected practice patterns is not yet clear.
Objectives: To: 1) assess practice patterns regarding laryngeal injection and thyroplasty procedures from 2012 through 2022; and 2) evaluate if changes in HCPCS codes in 2017 correlated with changes in practice patterns, such as practice setting.
Methods: The Centers for Medicare and Medicaid Services (CMS) Physician/Supplier Procedure Summary (PSPS) Master dataset from 2012-2022 was utilized in this analysis. HCPSC codes that are specific for vocal fold injections (e.g. 31513, 31570, 31571, 31573, 31574, L8607) and thyroplasty procedures (e.g. 31588, 31591) were evaluated. The number of procedures performed, place of service, and specialty were recorded.
Results: Total laryngeal procedures increased by 44.7% from 2012 through 2022, including a 52.3% increase in injections and 11.9% decrease in thyroplasty. While laryngeal injection procedures increased across all practice settings, there is a trend toward more office-based procedures (20% to 28%). In contrast, the proportion of laryngeal injection procedures in the hospital and ambulatory surgical center settings decreased from a height of 70% to 60% and 17% to 13%, respectively. Bilateral procedures increased by 165%, including a 121% increase in bilateral injection augmentation (code 31574).

Conclusions: Between 2012-2022, total laryngeal procedures increased across all practice settings, with a trend toward more injection laryngoplasty. The greatest rate of growth was noted in the office setting. Interestingly, the growth of bilateral procedures, particularly injection augmentation, suggests a growing demand to treat bilateral presbylarynx.

10:33 Discussion/Q&A

10:53 Break

11:15 Keynote Speaker:
Michael Hoa, MD
Cochlear Implant Candidacy Expansion: Importance of Hearing Preservation and the Role of Technological Innovation

12:15 Lunch/Break/Photos

2:15 Afternoon Introduction
Moderator: **Cassandra Puccinelli, MD**

2:20 **Jacob Hoerter, MD, Kaiser Permanente Oakland**
Unmasking Risk Factors for Post-COVID19 Olfactory Dysfunction: A Case-Control Study of Lost and Lingering Smells **(Clinical Study)**
Introduction: Loss of and altered sense of smell are prevalent symptoms after COVID-19 infection. While the pandemic spurred research into olfactory dysfunction (OD), the risk factors for developing COVID19-related OD remain unclear. We aimed to identify risk factors that contribute to COVID-19-related OD.
Methods: A case-control (1:3) study was performed. Cases were adult patients with OD after COVID-19 diagnosis between July 2020 and June 2021; controls were adults with a COVID-19 diagnosis without OD. OD was subclassified as acute smell loss (<3 months), chronic smell loss (>3 months), or altered sense of smell (e.g. parosmia, phantosmia). Bivariate tests and multivariable logistic regression were performed to analyze risk factors (sociodemographic and clinical characteristics) for general OD and its subtypes.
Results: Of the 4,220 patients that met criteria, 1055 (25%) had OD. Of those with OD, 650 (61.6%) had acute smell reduction, 350 (33.2%) had chronic smell reduction, and 245 (23.2%) had altered sense of smell. Older (OR 0.84, 95% CI 0.79-0.89), male (OR 0.62, 95% 0.54-0.72), Asian (OR 0.75, 95% CI 0.59-0.95), and fully-vaccinated (OR 0.46, 95% CI 0.28-0.75) patients were less likely to experience OD. Having seasonal allergies (OR 1.44, 95% CI 1.11-1.86) and being hospitalized (OR 1.52, 95% CI 1.14-2.02) increased the risk of OD. Compared with acute loss, chronic smell loss was more likely in older, female, non-Caucasians, hospitalized, and cerebrovascular disease patients ($p<0.05$). Women and hospitalized patients have higher risk of altered sense of smell ($p<0.05$).
Conclusion: Understanding the clinical course and prognosis of post-COVID-19 OD is becoming increasingly important and may provide broader insight into post-viral

OD. Being younger, female, and atopic conferred the highest risk of OD after COVID-19.

2:27 **Anthony Thai, MD, Stanford University**

Association Between Ultra Processed Food Intake and Sinusitis **(Clinical Study)**

Introduction: Ultra processed foods (UPF) are industrial formulations derived mostly from substances refined or extracted from foods. Recent studies have demonstrated possible associations between UPF intake and asthma, allergies, pro-inflammatory states, and immune dysregulation. We investigate the association of UPF intake with sinusitis and sinonasal symptoms.

Methods: We retrospectively reviewed three cycles of the National Health and Nutrition Examination Survey (NHANES), ranging from 2005 to 2014, which includes dietary and sinonasal symptom data on a large, representative sample of the US population. Individuals were divided into quartiles based on the percent of daily caloric intake consisting of Nova category 4 UPF. Multivariable logistic regression was performed to assess the association of UPF intake with sinonasal symptoms, adjusting for demographic data and medical comorbidities.

Results: 10,068 individuals (mean age 54.2 years, 52.1% female) were studied. Compared to the lowest quartile of UPF intake, the highest quartile had a higher rate of asthma (16% vs 11%, p=0.03), obesity (40% vs 30%, p<0.001), emphysema (2.9% vs 1.8%, p= 0.02) and food insecurity (26% vs 21%, p=0.002). On multivariable regression, UPF intake was associated with sinusitis (OR= 1.52, 95% CI 1.14-2.04, p=0.008) and dysgeusia (OR 1.73, CI 1.13-2.65, p=0.03) but not hyposmia, nasal congestion, allergies or hay fever.

Conclusions: UPF intake is significantly associated with sinusitis and dysgeusia, although not with other sinonasal symptoms. These findings highlight the potential impact of dietary choice on sinonasal conditions and the need to explore whether reduced UPF intake could serve as a modifiable risk factor for sinonasal health.

2:34 **Jacquelyn Callander, MD, University of San Francisco**

Characterizing the Genomic Landscape of Sinonasal Inverted Papilloma Using a Cancer Gene Panel **(Basic Science)**

Background: The etiology of sinonasal inverted papilloma (SNIP), clinical behavior, and predictive biomarkers for malignant transformation remain poorly defined. In this study, the genetic landscape of SNIP was characterized to provide insights into etiology and clinical behavior.

Methods: Patients presenting to a tertiary care center for surgical management of SNIP from June 2021-September 2024 were retrospectively enrolled. Clinical data was collected. A genetic panel analyzing the coding regions of 529 cancer genes via next-generation sequencing was performed on tumor tissue.

Results: 20 subjects met inclusion criteria with a mean follow-up time of 12.8 months (SD 12.2). 3 patients (15%) were found to have severe dysplasia and 1 patient (5%) was found to have malignant transformation. 85% of IPs demonstrated an EGFR exon 20 insertion, and the mean number of pathogenic or likely

pathogenic mutations identified was 2 (range 1-4). Malignant transformation was positively correlated to mutations in genes responsible for epigenetic regulation (r=0.459, p=0.042). Residual SNIP remaining after initial surgery requiring a staged approach to resection was associated with a higher number of pathogenic mutations (p=0.006) and was positively correlated with mutations in DNA repair genes (r=0.577, p=0.0077). 9/11 tumors tested (82%) were negative for human papilloma virus via in situ hybridization.
Conclusion: This study provides insights into the genomic landscape of SNIP, highlighting the prevalence of EGFR exon 20 insertions and identifying a novel association of epigenetic and DNA repair gene mutations with malignant transformation and residual tumor presence, respectively.

2:41 **Ketan Jain-Poster, MD, Kaiser Permanente Oakland**
***Radiologic Evidence of Delayed Frontal Sinus Disease After Feminizing Frontal Cranioplasty* (Clinical Study)**
Introduction: Feminizing frontal cranioplasty (FFC) has emerged as an essential technique in feminization of the upper third, often involving the violation of the anterior table of the frontal sinus. Though case reports document serious frontal sinus complications years after external approaches involving the frontal sinus, no studies to date examine the objective presence of frontal sinus disease on long-term imaging surveillance after FFC.
Methods: Adult patients who underwent FFC with type III forehead classification between the months of August 2016 to December 2019 at a single integrated healthcare system were invited to complete computerized tomography (CT) scans after surgery. Preoperative and postoperative CT were compared using the Lund-Mackay (LM) scoring system and assessed for the presence of frontal sinus disease. Retrospective chart review for demographic data and new diagnoses of sinusitis were extracted for included patients.
Results: A total of 40 patients met inclusion criteria. The average time from surgery to postoperative CT scan was 71 months (median: 67.5 months; range: 56 to 96 months). The mean preoperative and postoperative total LM scores were 1.3 and 1.75 (p=0.94), respectively. The mean frontal sinus-specific preoperative and postoperative LM scores were 0.1 and 0.13 (p=0.73), respectively. Five patients exhibited frontal sinus mucosal thickening on postoperative CT scans, and significant frontal sinus pathology (e.g. mucoceles) were not found in any patients.
Conclusions: Feminizing frontal cranioplasty appears to be a relatively safe procedure with low risk for the development of frontal sinus-related complications within the first 6 years after surgery. No patients in the presented cohort demonstrated serious frontal sinus disease, including mucocele, frontal osteomyelitis, or sinocutaneous fistula on delayed imaging. Continued surveillance follow-up and imaging should be considered to detect serious frontal sinus pathology that may develop beyond this time frame.

2:48 **Eric Wei, MD, Stanford University**

Facial Nerve Disorders: Incidence and Sociodemographic Predictors of Dynamic Facial Reanimation in the United States **(Clinical Study)**

Background: Recent surgical innovations have increased available treatment options for patients with facial nerve disorders (FND), leading to substantial improvements in functional and psychosocial outcomes. However, emerging evidence has begun to highlight social disparities in overall rates of surgical treatment among patients with FND. Currently however, it is unclear whether sociodemographic factors are associated with likelihood of undergoing dynamic facial reanimation procedures, which are gold standard treatment options for restoring voluntary movement. Additionally, incidence data on FND are currently limited.

Methods: This was a retrospective cohort study of U.S. adults from 2007-2022 using the Merative Marketscan Database. Trends in incidence and surgical management of FND were described. Chi2 and logistic regression analyses were performed.

Results: Among 4,730 adults who underwent FND surgical intervention, 1,390 (34.2%) underwent dynamic facial reanimation. In multivariable regression analyses, more recent treatment year, younger age, and living in the Northeast U.S. were significant predictors of undergoing dynamic reanimation. Additionally, from 2007-2022, the total adult incidence of all FND was 30.5/100,000, and the total incidence of Bell's Palsy alone was 24.5/100,000. Over the study period, there was a mean significant annual increase of 2.1 cases of FND/100,000 (95% Confidence Interval [CI] 1.8, 2.3; $p<0.001$), and of 1.5 cases of Bell's Palsy/100,000 (95% CI 1.2, 1.7; $p<0.001$). The total incidence of FND was higher in males (33.1/100,000) than in females (28.4/100,000, $p<0.001$), and greater in older age groups ($p<0.001$).

Conclusions: This study provides up-to-date incidence rates for Bell's Palsy and all FND, based on national administrative claims data. Incidence rates of FND and Bell's Palsy alone have been increasing in the U.S. from 2007-2022. Moreover, these analyses demonstrate significant sociodemographic and temporal associations in the surgical management of FND. Future work is needed to evaluate how sociodemographic factors might influence access and decisions to pursue different reanimation procedures.

2:55 Discussion/Q&A

3:15 **Evan Patel, MD, University of California San Francisco**

Therapeutic Effectiveness of Atresia Plasty Compared to Osseointegrated Bone Conduction Devices **(Clinical Study)**

Background: Atresiaplasty and placement of an osseointegrated bone conduction device (OBCD) are both options to restore hearing in children with congenital aural atresia. We aimed to compare total access to sound in patients who underwent atresiaplasty or placement of an OBCD.

Design: We conducted a retrospective cohort study at a single tertiary academic center of all pediatric patients with congenital aural atresia. The primary aim was to

compare the therapeutic effectiveness of atresiaplasty and OBCD. Mean disease alleviation (MDA) of the air conduction pure tone average (AC PTA) was calculated based on post-operative change in air conduction thresholds with weighting of the hearing benefit based on device usage in the OBCD cohort.
Results: A total of 169 pediatric patients (56.2% male, 83.4% complete) with congenital aural atresia were identified. The most common hearing intervention was atresiaplasty (33.7%) followed by softband BAHA (27.8%), OBCD (26.0%), no intervention (12.4%) and behind the ear hearing aid (1.8%). 45 ears treated with atresiaplasty and 38 ears implanted with an OBCD were found to have complete pre- and post-operative audiometric data and were included in the analysis. Mean time between surgery and most recent post-operative audiogram was 24.3 months (SD 21.8 months) and 24.3 months (SD 15.8) in the atresiaplasty and OBCD cohorts respectively ($p = 0.99$). The improvement in AC PTA after OBCD was higher compared to atresiaplasty (59.6% vs 37.1%, $p < 0.001$). However, MDA of AC PTA was greater in the atresiaplasty cohort compared to OBCD (37.1% vs 23.0%, $p = 0.001$). Multivariable regression accounting for clinical and sociodemographic co-variates also demonstrated a higher MDA for atresiaplasty compared to OBCD ($p = 0.01$).
Conclusions: In select patients with aural atresia, external auditory canal reconstruction may provide improved hearing benefit compared to OBCD due to variable utilization of an external device.

3:22 **Elias Saba, MD, Kaiser Permanente Oakland**
***Age-Stratified Analysis of Imaging Utility in Suspected Retrocochlear Pathology* (Clinical Study)**
Introduction: All patients with vestibular schwannoma (VS) undergo either observation with serial MRIs or treatment with surgical resection or stereotactic radiosurgery. Observation with serial MRIs can provide financial and time-based burden to both the patient and healthcare system, particularly in elderly patients with slow-growing tumors that often do not require intervention. This retrospective cohort study investigates intervention rates and imaging utilization among age-based cohorts of patients diagnosed with VS.
Methods: A multicenter institutional database was searched for adult patients diagnosed with VS between 01/01/2008 to 12/31/2017. Patients were stratified into age-based cohorts and followed for five years after diagnosis. CPT codes were used to identify patients managed with either surgery or radiation/radiotherapy. The observation cohort included patients who did not undergo intervention within the first 3 months after diagnosis. Retrospective cohort analysis was conducted among patients undergoing observation to identify those who later underwent intervention. Chi square analyses were used to compare intervention and MRI data among the cohorts.
Results: In comparison to younger patients, older VS patients demonstrated a statistically significant decrease in initial intervention rates ($p<0.0001$), as well as a decreased risk of conversion to intervention ($p<0.0001$). In patients undergoing

initial observation who later underwent intervention, the time to treatment was statistically longer among older patients (p=0.006).
Discussion/Conclusions: Over the last 40 years, the annual incidence of VS among older adults has dramatically risen, in part due to the increased use and improved sensitivity of MRIs among this cohort. Though accepted screening criteria are universal regardless of patient age, older patients are less likely to undergo intervention. This study suggests that among certain elderly patients, the use of MRI screening for retrocochlear pathology may be deferred due to the limited yield of detecting treatable pathology. Older patients who do undergo observation may be amenable to wider screening intervals.

3:29 **Karen Hoi, MD, University of California Davis**
***Evaluating the Role of Mastoid Air Cell Volume on Temporal Bone Fractures* (Clinical Study)**
Background: Of the 1.7 million traumatic brain injuries in the U.S. annually, 4-22% of patients with skull fractures sustain a temporal bone fracture. Otic capsule-violating fractures account for 2.5-5.6% and are linked to higher risks of complications such as facial nerve injury, CSF leak, and hearing loss. Although temporal bone pneumatization has been theorized to contribute to physiologic pressure regulation, weight distribution and shock absorption, mastoid pneumatization as measured by mastoid air cell volume has not been previously explored as a predictor of individual risk for temporal bone fractures. This retrospective study aims to investigate the relationship between mastoid aeration, as measured by air cell volume, and rates, patterns and complications of temporal bone fractures.
Methods: Adult patients (aged >18 years) with temporal bone fractures treated at a Level 1 trauma center who had a CT temporal bone scan completed as part of their trauma work up and were evaluated by the ENT consult team between the years of 2018 and 2024 were retrospectively reviewed. Patients with fractures limited to the squamosal bone or a history of prior otologic surgery were excluded. The mastoid portion of fractured temporal bones were segmented in three-dimensions using Materialise Mimics software, and both mastoid bone and mastoid air cells were separately isolated by adjusting hounsfield units for bone and air windows in order to obtain mastoid bone and air cell volumes, respectively. Mastoid air cells with blood products were separately segmented to be included in air cell volume. Results were correlated to temporal bone fracture patterns and complications. Mastoids from age and sex matched patients with radiographically healthy ears were included as a control group.
Results: Thirty nine patients with 47 temporal bone fractures met inclusion criteria. Mean age was 42.9 (range 18-89) and majority of fractures were in male patients (89.7%, n=35). Eight patients (20.5%) had bilateral fractures. The most common mechanism of injury was fall (30.8%, n=12) followed by MVC (20.5%, n=8) and auto vs. pedestrian accidents (17.9%, n=7). Mixed longitudinal and transverse fractures were the most common fracture pattern (42.6%, n=20) followed by longitudinal

fractures. Majority of fractures were otic capsule-sparing (89.3%, n=42), facial nerve sparing (66%, n=31), and not complicated by CSF leak (87.2%, n=41). The mean mastoid bone volume in temporal bone fracture patients was 15,968.6mm^3, mean air cell volume was 4,749.9mm^3, and mean mastoid aeration as measured by percentage of air cell volume over total mastoid volume was 23.1%. There was no statistically significant difference in measured mastoid aeration between temporal bone fracture patients and age/sex matched controls with radiographically healthy mastoids (23.1% vs. 26.2%, p=0.09). Patients with otic capsule-sparing fractures, intact facial nerve function, and absence of CSF leak had more aerated mastoids than those with otic capsule-violating fractures (23.3% vs. 20.8%, p=0.49), immediate-onset complete facial paralysis (23.8% vs. 18.7%, p=0.07), and CSF leak (24.4% vs. 15.8%, p=0.002).

Discussion/Conclusion: In our cohort of patients with temporal bone fractures, those who sustained an otic capsule-violating fracture, immediate-onset complete facial paralysis, or CSF leak had less mastoid aeration compared to patients without these complications. These findings suggest that greater mastoid aeration may confer a protective effect against severe complications of temporal bone fractures and support existing theories regarding the role of the mastoid air cell system in shock absorption.

3:36 **Nicholas Toomey, MD, University of California Davis**

Does Beta-2-Transferrin Testing Affect Decision Making in Patients With CSF Otorrhea **(Clinical Study)**

Introduction: Beta-2-transferrin (B2T) in an extremely specific and sensitive test often ordered when there is concern for patients with cerebrospinal fluid (CSF) otorrhea. The goal is to determine if this expensive test affects interventions implemented for these patients.

Methods: A retrospective chart review was performed of all patients from 2000-2024 who presented to UC Davis Medical Center who were diagnosed with CSF otorrhea and had a B2T test ordered. Data was collected on patient demographics (age and sex), the etiology of the CSF leak, and the location of presentation (inpatient, emergency department, or clinic). It was determined if and when interventions such as skull base precautions, lumbar drain placement, and surgery were implemented. Complications of CSF leak including meningitis, seizures, hearing loss, recurrence of leak, readmission, and death were analyzed.

Results: Twenty-nine patients (19 males, 65.5%) with CSF otorrhea met inclusion and exclusion criteria. The etiologies of CSF otorrhea were traumatic (20 patients, 68.9%), spontaneous (five patients, 17.2%) and post-operative (four patients, 13.8%). On average B2T results returned in 6 days.

In the cohort, skull base precautions were implemented an average of -7.3 days ($p<.05$) from B2T result. Eleven out of 29 patients (37.9%) had a lumbar drain (LD) placed and the average time from B2T result to LD placement was -3.46 days ($p<.05$), with 8 out of 11 (72.7%) of these occurring before B2T resulted. Surgical intervention was performed in 12 out of 29 patients (41.3%), and the average time

from B2T results to surgery was 11.22 days (median 4.11 days), with 4 out of 12 (33%) occurring before B2T resulted (P=.11). There was no statistically significant difference when comparing timing of interventions between traumatic, spontaneous, and post-operative causes of CSF otorrhea (P>.15).
Conclusion: The data shows that B2T testing has no impact on clinical decision-making for CSF otorrhea treatment regarding implementation of skull base precautions and lumbar drain placement. However, B2T testing may affect decision making for surgical intervention.

3:43 Discussion/Q&A

4:05 Conclusion

4:30 Reception/Awards Announcement
Pomella
3770 Piedmont Ave, Oakland, CA

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 and faculty
for their continued commitment to resident education.

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Friday, May 8, 2026

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