2021 TRIOLOGICAL SOCIETY COMBINED SECTIONS
VIRTUAL MEETING
JANUARY 29-30, 2021
ALL TIMES ARE EASTERN

CONTINUING MEDICAL EDUCATION CREDIT INFORMATION

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AMERICAN COLLEGE OF SURGEONS
DIVISION OF EDUCATION

FRIDAY, JANUARY 29, 2021

General Session

4:00 - 4:05 **WELCOME BY THE VICE PRESIDENTS**
Dana M. Thompson, MD FACS, Chicago, IL, Middle Section VP *(speaker)*
Donald T. Donovan, MD FACS, Houston, TX, Southern Section VP
David E. Eibling, MD FACS, Pittsburgh, PA, Eastern Section VP
Marilene B. Wang, MD FACS, Los Angeles, CA, Western Section VP

4:05 - 4:10 **PRESIDENT'S REMARKS**
C. Gaelyn Garrett, MD MMHC, Nashville, TN

4:10 - 5:05 **TRIOLOGICAL SOCIETY BEST PRACTICES**
Moderator:
Anil K. Lalwani, MD FACS, New York, NY
Panelists:
When Is Surgical Intervention Indicated for Vocal Fold Leukoplakia?
Dinesh K. Chhetri, MD, Los Angeles, CA
Do Antivirals Improve Hearing Outcomes in Neonates with Congenital Cytomegalovirus Infection?
Sanjay R. Parikh, MD, Seattle, WA
Is Sublingual Immunotherapy an Effective Therapy for Allergic Rhinitis?
Andrew P. Lane, MD, Baltimore, MD
What Is the Optimal Duration of Antibiotic Prophylaxis in Clean-Contaminated Head and Neck Surgery?
Samir S. Khariwala, MD, Minneapolis, MN
Should the Contralateral Tonsil Be Removed in Cases of HPV-Positive Squamous Cell Carcinoma of the Tonsil?
Maie A. St. John, MD, Los Angeles, CA

4:57 - 5:05 **Moderator Wrap Up/Q&A**

5:05 - 5:30 ***VISIT EXHIBITORS (LIVE SESSION)***

5:30 - 6:20 **WHY THINGS MAY NOT GO RIGHT IN CLINICAL PRACTICE: LEADERSHIP, FOLLOWERSHIP AND THE ROLE OF BIAS**
Moderator:
Myles L. Pensak, MD FACS, Cincinnati, OH
Panelists:
Donald T. Donovan, MD FACS, Houston, TX
David E. Eibling, MD FACS, Pittsburgh, PA
Dana M. Thompson, MD FACS, Chicago, IL
Marilene B. Wang, MD FACS, Los Angeles, CA

6:15 - 6:20 **Moderator Wrap Up/Q&A**

6:20 - 6:30 ***Break***

6:20 - 7:20 ***Chat Lounge Open***

6:30 - 8:10 Concurrent Session A1
Pediatric Otolaryngology

6:30 - 7:10 **TRIO/ASPO JOINT PANEL: OVERCOMING BARRIERS TO DEVELOPING AND RETAINING DIVERSE TALENT IN PEDIATRIC OTOLARYNGOLOGY**
Moderator:
Romaine F. Johnson, MD MPH, Dallas, TX
Panelists:
Alessandro de Alarcon, MD MPH, Cincinnati, OH
Steven L. Goudy, MD FACS, Atlanta, GA
Earl H. Harley, MD FACS, Washington, DC

7:05 - 7:10 **Moderator Wrap Up/Q&A**

7:10 - 7:20 ***Break***

Moderator: Alisha N. West, MD, Los Angeles, CA

7:20 **Do Psychiatric Comorbidities Affect Tonsillectomy Outcomes in Pediatric OSA?**

Nehal Dhaduk, BS, Newark, NJ; Sudeepti Vedula, BS, Newark, NJ (Presenter); Gregory L. Barinsky, PharmD, Newark, NJ; Kelly Speich, MD, Newark, NJ; Evelyne Kalyoussef, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discern the effects of psychiatric disorders on complication rates and outcomes in patients undergoing tonsillectomy and a diagnosis of obstructive sleep apnea.

Objectives: The association between mental health disorders and adverse tonsillectomy outcomes is underrepresented in literature. This study assesses the effects of psychiatric disorders on complication rates and outcomes in patients undergoing tonsillectomy with or without adenoidectomy (TA) and a diagnosis of obstructive sleep apnea (OSA). **Study Design:** Retrospective cohort review. **Methods:** The Kids' Inpatient Database (KID) 2000-2012 was queried for patients between the ages of 3 to 21 with a diagnosis of OSA and concomitant TA. Patients were stratified into a group with comorbid psychiatric conditions and a group without any. Univariate and multivariate analyses were performed to compare demographics and outcomes between the two groups. **Results:** A total of 14,946 cases were identified. Of these, 1573 (10.5%) patients had a psychiatric diagnosis. A majority of these patients were 3 to 5 years old (41.4%), white race (47.6%), and male (65.1%). The most common diagnoses were developmental disorders (59.9%), ADHD (19.0%), and autism (18.8%). When accounting for demographics and comorbidities such as asthma and coagulopathy, patients with psychiatric diagnoses were more likely to have minor respiratory complications (OR 1.408; [1.117-1.776]), major respiratory complications, (OR 3.274; [2.491-4.303]), and dehydration (OR 2.031; [1.350-3.056]) on both univariate and multivariate analyses. Patients with mental health disorders also had a significantly longer length of stay (3.49 vs 2.00; OR 1.038; [1.027-1.049]), and increased hospital charges ($27,328.38 vs $15,260.12; OR 1.200; [1.114-1.233]). **Conclusions:** 10.5% of patients undergoing TA with a diagnosis of OSA have a comorbid mental health disorder and are at a greater risk for postoperative complications with longer lengths of stay and increased hospital charges. These findings are important in today's changing healthcare system and rapidly growing rates of comorbid psychiatric conditions.

7:27 **Decannulation and Death Rates of Pediatric Tracheostomy Patients with Health Disparities**

Kershena Liao, MD, Dallas, TX; Romaine F. Johnson, MD MPH FACS, Dallas, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the association between residing in a high healthcare needs zip code and long term pediatric tracheostomy outcomes such as decannulation and mortality.

Objectives: We sought to determine decannulation and death rates among pediatric tracheostomy patients residing in communities affected by adverse health disparities. **Study Design:** Retrospective chart review. **Methods:** We conducted a retrospective chart review of pediatric patients who underwent tracheostomy at an academic medical center. Families were separated into low and high healthcare needs (HN) groups based on zip code of residence utilizing definitions from the local county's health and human services department. High HN areas had "high poverty, economic instability, and social ills." We used parametric survival regression models to analyze the hazard ratios (HR) of decannulation and mortality after tracheostomy placement while controlling for potential confounding conditions. **Results:** From 2015-2019, 214 patients with tracheostomies met inclusion criteria, of whom 78 (36%) resided in high HN zip codes. The decannulation (HR=0.90, 95% CI=0.52-1.55) and mortality rates (HR=1.15, 95% CI=0.51-2.56) were similar between both groups, suggesting that residing in high HN areas did not affect primary long term outcomes. However, parametric survival analysis of statistical interactions indicated that children requiring mechanical ventilation while living in high HN environments were less likely to decannulate over time (HR=3.68, 95% CI=1.16-11.65). Overall, the best predictors of decannulation and mortality hazard ratios were preterm status and sepsis during initial hospitalization, respectively. **Conclusions:** Living in high HN areas was not associated with adverse pediatric tracheostomy outcomes, except children requiring mechanical ventilation took longer to decannulate. Further study of the interaction between HN status and pediatric tracheostomy is warranted.

7:34 **Outcomes with Cochlear Implantation in Pediatric Patients with Enlarged Vestibular Aqueduct**

Liliya Benchetrit, MD, Boston, MA; Swathi Apachi, MD, Cleveland, OH; Yi-Chun Liu, MD, Houston, TX; Michael S. Cohen, MD, Boston, MA; Samantha Anne, MD MS, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to understand which outcomes can be expected following cochlear implantation in children with enlarged vestibular aqueduct.

Objectives: The effect of enlarged vestibular aqueduct (EVA) and intraoperative perilymph gusher associated with EVA on outcomes among children undergoing cochlear implantation (CI) is poorly characterized. We aimed to describe CI outcomes expected for children with EVA and determine the effect of gusher on outcomes. **Study Design:** Systematic review. **Methods:** Medline, Embase, Cochrane and CINHAL were searched from inception to February 2020, along with manual bibliography exploration. Studies reporting auditory, speech, language, patient described, and gusher occurrence outcomes in children with EVA undergoing CI were included. Two independent authors reviewed each abstract and article. **Results:** We identified 214 articles of which 48 met inclusion criteria, evaluating 1,048 patients. All studies identified improved outcomes following CI. Measured outcomes were variable but included pure tone average, speech recognition and intelligibility, and (Infant-Toddler) Meaningful Auditory Integration Scale. Thirteen (n=482) case control studies reported comparable outcomes between children with and without EVA, while 2 studies (n=30) reported greater improvement with CI among children without EVA. Seven studies (n=183) identified significantly greater improvement in speech and language development among children with isolated EVA as compared to EVA with incomplete partition type II (IP-II). Of 35 studies reporting intraoperative gusher (n=238; 22.7%), only 1 study identified unfavorable speech recognition scores associated with gusher. **Conclusions:** Outcomes of children with EVA undergoing CI are favorable and largely comparable to outcomes in children without these malformations. Children with isolated EVA may derive greater benefit from CI as compared to children with EVA and IP-II. Intraoperative gusher does not seem to influence outcomes.

7:41 Systematic Review and Meta-Analysis of Delayed Facial Palsy after Middle Ear Surgery in the Pediatric Population

Benjamin Daniel Lovin, MD, Houston, TX; Alex D. Sweeney, MD, Houston, TX; Kristan Alfonso, MD, Atlanta, GA; Nandini Govil, MD, Atlanta, GA; Yi-Chun Carol Liu, MD, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the etiology of pediatric delayed facial palsy after middle ear surgery, understand the prognostic implications of patient age, and apply appropriate management strategies.

Objectives: To report four cases of delayed facial palsy (DFP) after pediatric middle ear (ME) surgery, systematically review and analyze the literature, and provide management guidelines. **Study Design:** Systematic review and meta-analysis. **Methods:** Systematic review and meta-analysis of PubMed, Cochrane Library, and Embase for keywords "delayed facial palsy" and "delayed facial paralysis" was performed to identify cases of pediatric DFP after ME surgery and analyze its incidence. These articles were assessed for level of evidence, methodological limitations, and number of DFP cases. Meta-analysis was performed to assess the incidence of pediatric DFP. Finally, a multi-institutional retrospective review of four pediatric patients with DFP was also conducted, and a comprehensive list of all pediatric DFP cases was assembled from literature review and the cases presented herein. **Results:** Seventeen cases of pediatric DFP from 15 publications were identified and the total incidence was found to be 0.11%. Pediatric incidence further varied by middle ear operation: 0.43% for tympanomastoidectomy, 0.21% for cochlear implantation, and 0% for stapes surgery. When excluding stapes surgery, the total incidence rate was 0.19% in children and 0.55% in adults. This difference was statistically significant (p=0.0428). Fifteen cases, in addition to the 4 presented herein, were suitable for inclusion in a comprehensive list. The mean age was 8.2 years. The average postoperative day of paresis onset was 5.6 with an average maximum House-Brackmann grade of 3.6. All patients obtained full facial recovery after an average of 23.9 days of paresis. **Conclusions:** Systematic review demonstrates that DFP after pediatric ME surgery is rare and has an excellent prognosis. Incidence is lower in children than in adults, potentially due to a lower prevalence of herpes virus latency. Children have a higher rate of full recovery and appear to do so at a faster rate than adults. No imaging is recommended in the work up of DFP, and systemic steroids are recommended for treatment.

7:48 Comparative RNA Sequencing and Pathways Analyses of Middle Ear Epithelia from Patients with Otitis Media and Healthy Controls

Kaleigh Alexis Stabenau, MD, Wauwatosa, WI; Tina Samuels, MS, Wauwatosa, WI; Nikki Johnston, PhD, Wauwatosa, WI; Joseph Kerschner, MD, Wauwatosa, WI

Educational Objective: At the conclusion of this presentation, the participants should understand the differential transcriptome expression between middle ear epithelia (MEE) obtained from patients with otitis media with effusion (OME) compared to MEE obtained from healthy controls and articulate the importance of these differences.

Objectives: Otitis media is among the most common pediatric diagnoses in the United States. Despite this prevalence, substantive gaps remain in our understanding of its pathogenesis. Investigation of molecular pathways involved in OM will facilitate better understanding of this disease and may elucidate novel therapeutic targets. In this study, RNA sequencing

was used to examine genetic differences between MEE from pediatric patients with OME undergoing tympanostomy tube (TT) placement and MEE from healthy controls undergoing cochlear implantation (CI) surgery. **Study Design:** Case control translational. **Methods:** Middle ear epithelia was collected from five pediatric patients diagnosed with OME undergoing TT placement and five otherwise healthy pediatric patients undergoing CI. Specimens underwent RNA sequencing and pathways analyses. **Results:** 1,292 genes exhibited differential expression in MEE from OME patients compared to controls. Upregulated genes in OM include genes that facilitate infection and formation of mucoid effusions. Downregulated genes include genes involved in intracellular cascades and auditory development. Top networks identified in OME were organismal injury and abnormalities, cell morphology, and auditory disease. Top ingenuity canonical pathways identified were axonal guidance signaling, which contains genes associated with auditory development and disease, and nicotine degradation II and III pathways. Associated upstream regulators included beta-estradiol, dexamethasone, and G protein coupled estrogen receptor-1 (GPER1). These regulators are associated with otoprotection or inflammation during insult. **Conclusions:** RNA sequencing demonstrates differential gene expression in MEE from patients with OME compared to healthy controls with important implications for infection susceptibility, hearing loss, and a role for tobacco exposure in the development and/or severity of OME in pediatric patients.

7:55 **MAUREEN HANNLEY 2020 THESIS AWARD FOR ALTERNATIVE SCIENCE**
Improving Efficiency of Postoperative Level of Care Selection for Pediatric Patients Undergoing Surgery on the Aerodigestive Tract: A Novel Approach
Jennifer M. Lavin, MD, Chicago, IL

8:02 - 8:10 **Moderator Wrap Up/Q&A**

8:10 ***Adjourn***

6:30 - 8:10 Concurrent Session A2
Head and Neck

Moderator: Ivan H. El-Sayed, MD FACS, San Francisco, CA

6:30 **Safety with Patient Directed Home Drain Removal in Head and Neck Surgery**
Rishabh Sethia, MD, Columbus, OH; Taylor Freeman, BA, Columbus, OH; Amanda Selhorst, PA-C, Columbus, OH; Katherine Mead, PA-C, Columbus, OH; Kelly Vala, CNP APRN, Columbus, OH; Nolan Seim, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to evaluate safety of home drain removal, benefits for patients following head and neck surgery and identify processes for implementation.

Objectives: The purpose of this study was to evaluate the efficacy and safety of at home drain removal in head and neck surgery patients. **Study Design:** The study population included patients who underwent head and neck surgery at an academic tertiary care center between February 2020 and May 2020 and were discharged home with a maximum of two drains. **Methods:** Prior to discharge, patients received thorough drain removal education. Patients were prospectively followed to evaluate for associated outcomes. **Results:** Fifty-two patients (thirty-seven men (71.1%) and fifteen women (28.9%)) were evaluated in the study. Forty-nine patients received education at discharge (94.2%). The most common methods of education were face to face education and written instructions with educational video link provided. Of sixty-four drains discharged home, fifty-four drains (84.4%) were removed at home while ten were removed in office. Most drains were located in the neck. There was one seroma, one hematoma, two drain site infections and four ED visits but none of these complications were directly associated with the action of drain removal at home. Calculated cost savings for travel was $72.65 per round trip. **Conclusions:** The results demonstrate that home drain removal can provide a safe and efficacious option for patients following head and neck surgeries. A low rate of complications was demonstrated in addition to travel time and funds saved. Furthermore, patients and healthcare providers avoided additional office encounters during the Covid-19 pandemic in most instances. Our findings warrant further investigation into cost savings and formal patient satisfaction associated with home drain removal.

6:37 **Outcomes of Salivary Stone Removal with and without Salivary Endoscopes**
Kimberly Keen Coca, BS, Memphis, TN; Ezer H. Benaim, BA, Memphis, TN (Presenter); Leighton Reed, MD, Memphis, TN; Madhu Mamidala, PhD, Memphis, TN; M. Boyd Gillespie, MD MSc, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to compare outcomes of sialolithiasis treatment with sialendoscopy versus other gland preserving methods.

Objectives: For patients with sialolithiasis, there are many gland preserving treatment options including sialendoscopy. The objective of this study is to compare the outcomes of patients with sialolithiasis undergoing sialendoscopy versus those undergoing other gland preserving treatment options. **Study Design:** Prospective trial of patients with sialolithiasis treated using gland preserving methods, with or without sialendoscopy, between 2017 and 2020 at a tertiary academic medical center. **Methods:** A total of 28 patients with sialolithiasis received gland preserving treatment: 13 underwent treatment with sialendoscopy and 15 underwent treatment without sialendoscopy. Factors analyzed between the two groups included age, race, gender, size of stone, location of stone, gland(s) involved, surgical method (sialendoscopy, formal dochoplasty, or combined approach), and Oral Health Impact Profile (OHIP) scores before and after therapy. Results are reported using an independent t-test. **Results:** The sialendoscopy and non-sialendoscopy patient populations had no significant differences in age or gender. Sialendoscopy and non-sialendoscopy treatment options both had statistically significant post-procedural improvement measured by change in OHIP scores (p=0.0001 and 0.002, respectively). There was no statistically significant difference in improvement found when comparing sialendoscopy and non-sialendoscopy treatment options (p=0.68). **Conclusions:** Sialendoscopy is an important diagnostic and therapeutic tool in the management of salivary disorders, but is not necessarily associated with improved outcomes in gland preserving treatments for sialolithiasis. Transoral stone removal alone may have equivalent symptomatic outcomes in the management of select sialoliths.

6:44 Understanding Pediatric Oral Cavity Malignancies: A Population Based Study

Nehal Dhaduk, BS, Newark, NJ; Salma Ahsanuddin, BS, Newark, NJ (Presenter); Rohan Sawhney, BA, Newark, NJ; David W. Wassef, BS, Newark, NJ; Neel R. Sangal, MD, Philadelphia, PA; Richard Chan Woo Park, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the epidemiology, patient characteristics, prognosis, and treatment strategies for pediatric patients with oral cavity malignancies.

Objectives: This study is designed to investigate the epidemiology, tumor physiognomies, and outcomes of pediatric oral cavity malignancies using a population based database. **Study Design:** Retrospective cohort study. **Methods:** The Surveillance, Epidemiology, and End Results (SEER) database was queried for patients < 18 years old who have been diagnosed with pediatric oral cavity malignancies. Data were acquired on incidence, histology, staging, grade, extent of disease, treatment administered and survival outcomes. **Results:** There was a total of 252 cases of pediatric oral cavity malignancies (POCM) identified through the database from 1973-2014. The analysis revealed that the average age was 11.8 years, 53.2% were female, 60.7% were white, and 86.5% lived in an urban metropolitan area. Mucoepidermoid carcinoma (MC) was the most frequent malignancy (34.9%) and hard palate (HP) was the most frequent primary site (22.2%). The incidence of HP malignancy in MC was 62.9%. The disease specific survival (DSS) rates for all cases were 87.4%. Patients treated with surgery alone had the highest DSS rate (94.7%). Significant differences in survival rates were noted with regards to histology, primary site, staging, grading, extent of disease, and treatments done. On multivariate regression, accounting for these confounding variables, grade at diagnosis, and treatment type were significant predictors of survival. **Conclusions:** POCM presented most frequently as mucoepidermoid carcinoma with the highest occurrence in the hard palate both within this specific malignancy and overall. Our study shows that surgery alone is the treatment of choice for a majority of POCM.

6:51 Chordoma of the Skull Base and Cervical Spine: Trends in Operative Management and Outcomes at a Tertiary Medical Center

Albert Y. Han, MD PhD, Los Angeles, CA; Zachariah K. Chandy, MD, Los Angeles, CA; Dipti P. Sajed, MD PhD, Los Angeles, CA; Dinesh K. Chhetri, MD, Los Angeles, CA; Maie A. St. John, MD PhD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the trends and outcomes in management of skull base and cervical spine chordomas.

Objectives: To characterize the demographics, clinicopathologic characteristics, treatments, complications, and outcomes of patients who underwent treatment for chordoma of the skull base and cervical spine at an academic tertiary care medical center. **Study Design:** Retrospective chart review of all patients who received a diagnosis of chordoma between January 1, 1990, and September 30, 2019. **Methods:** All patients who had undergone management for head and neck chordoma were included in the analysis. Patient characteristics and clinical outcomes were reviewed. **Results:** Seventy-three patients received a diagnosis of chordoma. Fifty-five patients had a new diagnosis and 18 patients presented for treatment of recurrence. The mean age at diagnosis was 46.0 (range, 3-79.2, n=55). About 85% of patients had chordoma of the skull base, and the clivus was the most common area of involvement. Chondroid chordoma comprised 64% of known chordoma subtypes. The maximum tumor dimension was 3.7cm. For newly diagnosed chordoma patients, one year survival was 98%,

five year survival was 90%, and ten year survival was 52%. Trends in surgery showed the common use of facial degloving and approach in early 1990s that has been replaced by endoscopic transnasal transsphenoidal techniques. Mean time to recurrence after treatment was 38.6 months for those who experienced recurrence, with greater time to recurrence when adjuvant radiation was added. **Conclusions:** Chordomas are rare neoplasms with a notorious tendency to recur. The use of an endoscopic anterior skull base approach has replaced traditional midfacial degloving approaches. While adjuvant proton and radiotherapy can help local control, regular surveillance is warranted given its tendency for recurrence.

6:58 **Two Step Surgery for Optimized Tracheal Construct Implantation**
Lidia Frejo, PhD, Manhasset, NY; Todd Goldstein, PhD, Manhasset, NY; Neha A. Patel, MD, New Hyde Park, NY; David Zeltsman, MD, New Hyde Park, NY; Daniel A. Grande, PhD, Manhasset, NY; Lee P. Smith, MD, New Hyde Park, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the benefits of a two step surgery in tracheal construct implantation since it has an advantage in terms of inflammatory response and maintenance of blood supply.

Objectives: To optimize tracheal construct features for cellular growth and mechanical properties in a two step surgery, and to confirm functionality of the engineered construct in vivo. **Study Design:** Descriptive. **Methods:** Male New Zealand White Rabbits (NZWR) were used as the animal model of choice. Chondrocytes were harvested from NZWR tracheal rings and cultured in 150cm2 flasks with DME/F12 supplemented with 10% FBS and 1% antibiotic-antimycotic at 37C, 5% CO2. Rabbit CT scans of the trachea were obtained, and a 3D CAD template created. A MakerBot replicator 2x was used to print the construct in PCL. To produce the bio-ink we combined collagen type I and 3% alginate medium viscosity (50:50) with previously harvested chondrocytes (2.5 million cells/mL). In vitro: we performed live/dead assay by using calcein A/ethidium at 2, 5, 7 and 14 days. Gene expression was performed using quantitative real time PCR at 1, 3, 7 and 14 days for the following genes: collagen type 1 and type 2, sox-9, aggrecan, and glyceraldehyde 3 phosphate dehydrogenase (Gapdh). Fold changes in gene expression were calculated using the ΔΔCT method measured against Gapdh (housekeeping gene). In vivo: The surgical implantation consisted of two separate steps: 1) to implant the construct within a pocket in the strap muscle for 2 weeks and; 2) to rotate the construct to its place within the trachea for 3 or 6 more weeks. Following euthanasia, the rabbit's trachea was explanted and bronchoscopy and histology were performed. **Results:** In vitro: after 14 days in culture the constructs showed >80% of surviving cells. Collagen type 2 and sox-9 were overexpressed since day 2 (12 fold change and 4 fold change, respectively) and by day 14 all genes were overexpressed (aggrecan = 3; collagen type 1 = 2, collagen type 2 = 12 and sox-9 = 4.2) when comparing the chondrocytes in the construct with chondrocytes in monolayer. In vivo: by day 21 (before the rotation), cartilage formation could be seen surrounding all the constructs. After a total of 6 or 9 weeks in the body, good biocompatibility and biointegration were seen at the implantation site. Mature cartilage similar to native trachea was observed after 9 weeks. **Conclusions:** Our design is optimized yielding a high quality, printable segment with cellular growth and viability. Histology reveals persistence of cartilage tissue and a good integration at the graft-host interface.

7:05 - 7:10 **Moderator Wrap Up/Q&A**

7:10 ***Break***

7:20 - 8:05 **HEAD AND NECK PANEL: QUALITY AND VALUE FOR HEAD AND NECK CANCER TREATMENT**
Moderator:
Chad A. Zender, MD FACS, Cincinnati, OH
Panelists:
Measuring Quality in Head and Neck Cancer Treatment
Christine G. Gourin, MD FACS, Baltimore, MD
Quality in the Treatment of Oropharyngeal Cancer…Chemo/XRT or Surgery and Radiation
Robert L. Ferris, MD PhD FACS, Pittsburgh, PA
Bundled Care and ERAS Protocols for the Head and Neck Cancer Surgery
Carol M. Lewis, MD MPH FACS, Houston, TX

8:00 - 8:05 **Moderator Wrap Up/Q&A**

8:05 **Adjourn**

SATURDAY, JANUARY 30, 2021 – ALL EASTERN TIMEZONE

General Session

12:00 - 12:05 **Welcome by Vice Presidents**

12:05 - 12:55 **THIS IS HOW I DO IT VIDEO SESSION**
Moderator:
Willard C. Harrill, MD FACS, Hickory, NC
Panelists:
Canalith Repositioning Procedure
Scott Shapiro, MD, Cincinnati, OH (Presenter)
Joseph T. Breen, MD, Cincinnati, OH
Ravi N. Samy, MD FACS, Cincinnati, OH
Treatment of Keloids
Lamont R. Jones, MD MBA, Detroit, MI
Endoscopic Zenker's Diverticulum Repair
Dinesh K. Chhetri, MD, Los Angeles, CA
Hypoglossal Nerve Stimulation Therapy
Abie A. Mendelsohn, MD FACS, Los Angeles, CA
Butterfly Grafting
J. Madison Clark II, MD FACS, Chapel Hill, NC

12:47 - 12:55 **Moderator Wrap Up/Q&A**

12:55 - 1:15 ***VISIT EXHIBITORS (LIVE SESSION)***

1:15 - 2:45 Concurrent Session B1

Allergy/Rhinology

1:15 - 2:00 **RHINOLOGY PANEL: COVID ASSOCIATED PROBLEMS OF THE AIRWAY AND SENSES OF TASTE AND SMELL: WHAT IS KNOWN ABOUT OUTCOMES AND TREATMENT**
Moderator:
Jennifer M. Lavin, MD, Chicago, IL
Panelists:
Ramon A. Franco Jr., MD, Boston, MA
Allen M. Seiden, MD FACS, Cincinnati, OH
Stephanie S. Smith, MD, Chicago, IL

1:55 - 2:00 **Moderator Wrap Up/Q&A**

2:00 - 2:10 ***Break***

2:00 - 3:00 ***Chat Lounge Open***

Moderator: Amber U. Luong, MD PhD FACS, Houston, TX

2:10 **A Comprehensive Analysis of Treatment Management and Survival Outcomes in Nasopharyngeal Carcinoma**
Khodayar Goshtasbi, MS, Irvine, CA; Brandon M. Lehrich, BS, Irvine, CA; Jack Birkenbeuel, BS, Irvine, CA; Jeremy P. Harris, MD, Irvine, CA; Edward C. Kuan, MD, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to verbalize nasopharyngeal carcinoma outcomes dependent on clinical/demographic presentations and treatments. Moreover, stage and histology dependent treatment with the best associated outcomes will be known.

Objectives: To comprehensively investigate nasopharyngeal carcinoma (NPC) treatment, overall survival (OS), and the influence of clinical, demographic, and socioeconomic factors on receiving treatment and outcome. **Study Design:** National database study. **Methods:** The National Cancer Database was queried for all NPC patients diagnosed from 2004-2016 with definitive treatment. Log rank tests, cox proportional hazards models, and multivariate logistic regression were used for statistical analyses. **Results:** A total of 8,655 NPC patients (73.3% male, 43.6% keratinizing histology) were included with a mean age of 52.5 ± 15.1 years and 5 year OS of 61.4%. Predictors of mortality included age ≥ 65 years (HR=1.61, p<0.001), Charlson/Deyo score ≥ 1 (HR=1.17, p=0.03), AJCC clinical stage III-IV (HR=2.06, p<0.001), and government insurance/uninsured (HR=1.52, p<0.001). Predictors of survival included female gender (HR=0.87, p=0.02), Asian/Pacific Islander race (HR=0.75, p<0.001), and non-keratinizing/undifferentiated histology (HR=0.79, p=0.002). Chemoradiotherapy (CRT) demonstrated improved OS compared to radiotherapy only (RT) for stage II (p=0.03) and stage III (p=0.005), and to RT or chemotherapy only in stage IVA NPC (p<0.001). Compared to CRT alone, surgery+CRT provided OS benefits in keratinizing (p<0.001) or stage IVA NPC (p=0.013). Compared to RT, CRT provided OS benefits in keratinizing (p<0.001) but not in non-keratinizing (p=0.108) or undifferentiated NPC (p=0.310). Substandard radiation dosing of <60 Gy and <30 fractions were associated with inferior OS (both p<0.001). **Conclusions:** NPC survival is dependent on a variety of clinical/sociodemographic factors. Stage specific treatments with optimal OS include CRT or RT for stages I-II and CRT for stage III-IV. The large representation of nonendemic histology is valuable as these cases are not well characterized.

2:17 Chemosensory Function: A Practical Review for Otolaryngologists

Lauren Elizabeth Claus, BA, Baltimore, MD; Katherine Y. Tai, BA, Baltimore, MD; Rodney J. Schlosser, MD, Charleston, SC; Vidya Kamath, PhD, Baltimore, MD; Andrew Lane, MD, Baltimore, MD; Nicholas R. Rowan, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to inform clinical practice with a contemporary understanding of the physiology, clinical evaluation, and impact of chemosensory function.

Objectives: Chemosensory dysfunction is common in both general and otolaryngic patient populations, and it is associated with significant quality of life implications, in addition to detrimental effects on nutrition, socialization, and safety. Despite the commonality of olfactory and gustatory dysfunction in the otolaryngic patient population, these chemosensory disturbances are often overlooked. As experts of head and neck pathologies, otolaryngologists are uniquely qualified to manage these disorders. This investigation sought to provide otolaryngologists with a practical review of the relevant physiology and wide range of clinical assessments available for the evaluation of olfaction, gustation, and chemesthesis (i.e., trigeminal function). **Study Design:** Literature review. **Methods:** Comprehensive literature review of chemosensory function in health and disease. **Results:** Olfaction, gustation, and chemesthesis occur by separate physiological pathways but interact to contribute to subjective impressions of smell and taste. However, specific chemosenses can be assessed with a variety of validated and nonvalidated testing methods, ranging from self-report to more objective parameters, which include psychophysical, electrophysiological, and neuroimaging techniques. Self-report chemosensory assessments are increasingly popular, but psychophysical assessments are the most sensitive for olfactory and gustatory dysfunction. Although many validated olfactory evaluations exist, there are relatively few validated gustatory and chemesthetic evaluations in widespread use. **Conclusions:** Understanding of the interactions between olfaction, gustation, and chemesthesis is critical for the management of patients who experience chemosensory disruptions and subsequent changes in their daily functioning and quality of life. Psychophysical assessments of the chemosenses should be performed in clinical practice, given the inaccuracies of self-reported chemosensory assessments.

2:24 Physician Factors and Use of Balloon Sinuplasty in Chronic Rhinosinusitis

Smirnov Denis Exilus, BA, Baltimore, MD; Joseph Canner, BS, Baltimore, MD; Elliot Richard Haut, MD PhD, Baltimore, MD; Emily Frances Boss, MD MPH, Baltimore, MD; Nicholas Ray Rowan, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate physician level factors that are associated with outlier practice in the use of balloon sinuplasty in the Medicare population between 2012-2017.

Objectives: The use of balloon sinuplasty (BSP) in the management of chronic rhinosinusitis (CRS) has dramatically increased in popularity since its inception. This study seeks to identify the association between physician level factors and outlier BSP practice patterns in the Medicare population. **Study Design:** A retrospective analysis of Medicare claims data and the National Physician Compare datasets. **Methods:** Physician factors were defined as sex, practice size, geographic

setting, years of experience, procedure setting, and proportion of sinus procedures per total services. Outlier status was defined as performing total balloon procedures two standard deviations above the national mean at least once during the study period. **Results:** Sixty-six providers (4.7%) of out 1408 physicians met the criteria for outlier status and accounted for 44.3% and 4.6% of BSP and ESS procedures, respectively. Outlier status was associated with practice size of ten or fewer individual physicians (OR; 2.06, 95% CI [1.15, 3.67], P < 0.05), proportion of sinus procedures per total services two standard deviations above the mean (OR; 10.55, 95% CI [4.33, 25.66], P < 0.001), total services per beneficiary above two standard deviations (OR; 3.52, 95% CI [1.06, 11.70], P < 0.05), and performing 10 or fewer ESS procedures per year (OR; 20.40, 95% CI [7.66, 54.32], P < 0.001). Procedure setting, provider sex, and practice years were not associated with outlier status. **Conclusions:** Outlier BSP patterns are associated with small practice size, high proportion of ESS and BSP procedures relative to total services rendered, and performance of 10 or fewer endoscopic procedures per year.

2:31 Racial Disparities in Comorbid Conditions in Patients Undergoing Pituitary Surgery for Benign Neoplasms

Aksha Parray, BA, Newark, NJ; Chris B. Choi, BS, Newark, NJ; Aakash Shah, BS, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Jordon G. Grube, DO, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to investigate differences in comorbid conditions and to attain an understanding of demographic identity and representation of patients undergoing pituitary surgery for benign neoplasms in the context of a database study.

Objectives: The primary purpose of this study is to examine racial differences in comorbid conditions in patients undergoing pituitary surgery for benign neoplasms. **Study Design:** Retrospective database review. **Methods:** The 2005-2015 National Surgical Quality Improvement Program (NSQIP) database was used to identify patients that had undergone pituitary surgery for benign neoplasms via use of ICD-9 codes in conjunction with current procedural timing coding for surgical approach. Chi squared analysis, independent samples t-test, and logistic regression were used to determine statistical association in outcomes and aspects of procedural timing. **Results:** 1097 patients were identified. On univariate analysis, Black patients were statistically more likely to have an ASA classification of ≥2 (p=0.003). Black patients were also significantly associated with comorbid hypertensive medication use (p=0.001), having 58.3% prevalence of hypertension compared to just 46.1% in Caucasian patients. Non-Caucasian Hispanic patients demonstrated a statistically significant association with comorbid hypertensive medication use (p=0.048), comorbid wound contamination (p=0.013) as well as comorbid wound infection (p=0.015). On multivariate regression, Hispanic cohorts were found to have experienced likelihood of unplanned readmission compared to covariate White and Black cohort counterparts (OR 3.534, 95% CI 1.006-12.419, p=0.049). **Conclusions:** Black patients undergoing pituitary surgery for benign neoplasms were statistically more likely to be associated with ASA classification of ≥2 and comorbid hypertension. Non-Caucasian Hispanic patients demonstrated a statistically significant association with comorbid antihypertensive medication use, comorbid wound contamination, as well as comorbid wound infection.

2:38 Opiate Use after Endoscopic Endonasal Transsphenoidal Surgery

Tara J. Wu, MD, Los Angeles, CA; Reza Kianian, BS, Los Angeles, CA; Emmanuel G. Villalpando, MS, Los Angeles, CA; Morcos N. Nakhla, MS, Los Angeles, CA; Marvin Bergsneider, MD, Los Angeles, CA; Marilene B. Wang, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe how much opiate medications are needed postoperatively and on discharge for patients undergoing endoscopic endonasal transsphenoidal surgery (EETS); and 2) identify the risk factors associated with higher opiate use among patients undergoing EETS, so that providers may adjust opiate prescribing patterns for those at high versus low risk for greater postoperative pain.

Objectives: The literature on opiate use after endoscopic endonasal transsphenoidal surgery (EETS) is limited. This study sought to quantify opiate use after EETS and identify the risk factors associated with higher opiate use. **Study Design:** Retrospective review. **Methods:** Consecutive adult patients undergoing EETS from July 2018 to July 2020 were included. Patient, tumor, and surgical factors were documented. Pain scores and medications used on postoperative day (POD) 0/1 and discharge opiate prescriptions were recorded. Opiate use was quantified using morphine milligram equivalents (MME) dose. Multiple linear regression determined the risk factors associated with higher opiate use on POD 0/1. **Results:** 144 patients underwent EETS. 65 patients (45%) were male. 113 surgeries were performed for pituitary adenomas (78.5%). 22 surgeries (15.2%) were revision surgeries. On POD 0/1, average pain scores were 4.9/10 (SD ± 2.0); average acetaminophen use was 3.4 tablets (SD ± 1.6, 650 mg per tablet); average opiate use was 35.9 MME (SD ± 36.4). Multiple linear regression showed that current smoking status required an additional 45.5 MME (95% CI, 17.0 to 73.9, p=0.002) on POD 0/1. Thirty-nine patients (27.1%) did not require opiate prescriptions on discharge or within 30 days after surgery. For those who did require opiate prescriptions, the average prescription was 162.9 MME (SD ± 85.0), equivalent to 21.7 tablets

(SD ± 11.3) of oxycodone 5 mg; only 8 patients (5.6%) required opiate refill(s) within 30 days after surgery. **Conclusions:** Patients undergoing EETS have higher opiate needs compared to those undergoing endoscopic sinus surgery. A risk factor associated with higher opiate use postoperatively was current smoking status.

2:45 - 2:50 **Moderator Wrap Up/Q&A**

2:50 - 3:20 ***POSTER SESSION - VISIT WITH PRESENTERS (LIVE SESSION)***

1:15 - 2:50 Concurrent Session B2
Facial Plastic & Reconstructive Surgery

Moderator: Jimmy J. Brown, MD FACS, Gainesville, FL

1:15 **Septal Perforation Repair Utilizing the Upper Lateral Cartilage Mucosal Flap**
Amar Miglani, MD, Phoneix, AZ; Cullen Taylor, MD, Phoenix, AZ; Andy M. Courson, MD, Phoenix, AZ; Stephen F. Bansberg, MD, Phoenix, AZ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand conceptually how and when the upper lateral cartilage mucosal flap is developed and used for nasal septal perforation repair.

Objectives: The surgical repair of larger septal perforations utilizing intranasal mucosal flaps is limited by the amount of usable mucosa. The objectives of this study are to describe an endonasal perforation repair maneuver that incorporates mucosa from the ventral surface of the upper lateral cartilage into the repair and our closure outcome from this procedure. **Study Design:** Retrospective review of a single surgeon's experience attempting septal perforation closure from January 2007-December 2019. **Methods:** Perforation repairs which utilized a bipedicle flap incorporating mucosa from the undersurface of the upper lateral cartilage were identified. Patient and perforation characteristics, surgical technique, and outcomes were determined. **Results:** Sixty-six patients met study criteria. The mean perforation height was 16 (range, 8-26) mm. All repairs were performed endonasally and utilized bilateral mucosal flaps with an interposition graft. Temporalis fascia graft was used in 56 (85%) patients. Complete closure was noted in 60 (91%) patients at last followup. Fourteen patients underwent a planned secondary functional or aesthetic procedure. Persistent postoperative obstruction related to the repair was addressed in 11 patients. There was no instance of internal valve angle scarring. **Conclusions:** Perforation size and position are important factors when considering the feasibility of attempting closure utilizing mucosal flaps. Mucosa from the ventral surface of the upper lateral cartilage can be used to increase the width of a superior advancement flap to achieve complete, tension free closure. We report a 91% success rate using this maneuver for selected perforation flap repairs.

1:22 **Association between American Society of Anesthesiologists Physical Status Classification and Complications following Facial Fracture Repair**
Parisorn Thepmankorn, BS, Newark, NJ; Chris B. Choi, BS, Newark, NJ; Aakash Shah, BS, Newark, NJ; Aksha Parray, BA, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the importance of the American Society of Anesthesiologists (ASA) physical status classification and their association with rates of complications following facial fracture repair.

Objectives: To investigate the association between American Society of Anesthesiologists (ASA) physical status classification and rates of postoperative complications in patients undergoing facial fracture repair. **Study Design:** Retrospective database review. **Methods:** The American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database from 2005-2015 were reviewed. Chi square and Fisher's exact tests were used for univariate analysis. Multivariate logistic regression was used to assess the independent effect of covariates on postoperative complication rates. **Results:** 3,575 patients who underwent facial fracture repair with known ASA classification were identified. Patients were divided into two cohorts based on the ASA classification system: class I/II (no or mild-moderate systemic disturbance) and class III/IV (severe or extreme systemic disturbance). Univariate analysis of postoperative complications revealed that class III/IV patients had higher rates of deep surgical site infection ($p=0.012$) as well as bleeding, readmission, reoperation, surgical, medical, and overall postoperative complications ($p<0.001$). Multivariate regression analysis found that class III/IV was significantly associated with increased surgical complications (OR 4.836, 95% CI 1.137-20.564, $p=0.033$) and all complications (OR 2.239, 95% CI 1.343-3.732, $p=0.002$). Specifically, ASA class III/IV was associated with increased rates of bleeding (OR 7.320, 95% CI 1.638-32.722, $p=0.009$) and deep surgical site infection (OR

4.836, 95% CI 1.137-20.564, p=0.033). **Conclusions:** This study revealed that higher ASA physical status classification is associated with increased odds of bleeding and surgical site infections following facial fracture repair. Surgeons should be aware of the increased risk for postoperative complications when performing facial fracture repair in patients with high ASA classification.

1:29 **Association between Metabolic Syndrome and Complications following Rhinoplasty**

Karandeep Singh Randhawa, BS, Newark, NJ; Chris B. Choi, BS, Newark, NJ; Aakash Shah, BS, Newark, NJ; Aksha Parray, BA, Newark, NJ; Boris Paskhover, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the importance of metabolic syndrome and its association with complications following rhinoplasty.

Objectives: To investigate the association between metabolic syndrome status and rates of postoperative complications in patients who underwent rhinoplasty. **Study Design:** Retrospective database review. **Methods:** The 2005-2015 National Surgical Quality Improvement Program (NSQIP) database was used. Inclusion criteria included patients over 18 that have undergone rhinoplasty by an otolaryngologist. Metabolic syndrome (MetS) status was identified as having hypertension, obesity, diabetes simultaneously. Fisher's exact test and logistic regression were used to determine the independent effect of covariates on postoperative complication rates. **Results:** 1809 individuals received rhinoplasties by otolaryngologists were identified and divided into MetS (n=81) and Non-MetS (n = 1728) cohorts. Fisher's exact test revealed steroid use, dyspnea, peripheral vascular disease, and dialysis treatment as significantly higher in the MetS cohort compared to the unaffected cohort. Additionally, complication rates of unplanned intubation, progressive renal insufficiency, and medical complications were also higher in Mets patients. After adjusting significantly different comorbidities along with race, gender, and age, multivariate regression analysis indicated MetS was independently associated with higher rates of experiencing a medical complication following rhinoplasty (OR 3.658, 95% CI 1.064-12.578, p=0.040). Analysis of individual complication rates revealed metabolic syndrome had higher risks of deep surgical site infection (OR 19.484, 95% CI 2.460-154.295, p=0.005) and ventilator assisted respiration during postoperative hospitalization (OR 61.401, 95% CI 1.636-2303.784, p=0.026). **Conclusions:** This analysis highlights metabolic syndrome as an important factor leading to increased postoperative complications after rhinoplasty, and preventative measures can be taken to reduce risk of adverse complications.

1:36 **Facial Synkinesis Recurrence after Selective Neurolysis: A Small Case Series**

Kurren Gill, MD, Philadelphia, PA; Emily Sagalow, BS, Philadelphia, PA; Katie Holland, BS, Philadelphia, PA; Marisa Wu, BS, Philadelphia, PA; Joel Stanek, MD, Philadelphia, PA; Ryan Heffelfinger, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to investigate factors that affect likelihood of facial synkinesis recurrence after selective neurolysis.

Objectives: To determine the incidence of facial synkinesis recurrence after selective neurolysis (SN) and identify any trends towards increased recurrence. **Study Design:** Retrospective chart review. **Methods:** Patients with facial synkinesis were identified at a single academic institution between January 2008 to June 2020. Risk factors and various nonsurgical and surgical interventions were assessed. **Results:** Of 126 patients with facial nerve injury, 40 (32%) had synkinesis. Most common etiology was Bell's palsy (30, 70%), and most common presentations included: facial spasms (28, 66.7%), impaired oral commissure excursion (24, 57.1%), and oral ocular synkinesis (16, 38.1%). Eleven (25.5%) underwent SN with a median time of 6 years (range 1-15) from synkinesis onset to surgery. Eight facial nerve branches were lysed on average (range 4-13). Two (18%) developed recurrence after initial improvement. Both patients developed synkinesis after an episode of Bell's palsy 6 and 4 years prior to surgery, respectively. After preoperative Botox, they subsequently underwent SN where 13 and 5 cervical branches were lysed, respectively. Despite initial improvement and postoperative Botox, they developed recurrence of oral-oculo synkinesis and facial spasms at 14 and 30 months postoperatively. Facial rehabilitation utilization trended towards significance for decreased recurrence (p=0.087). Time from synkinesis onset to SN and number of branches lysed was not significantly associated with recurrence (p>0.05). **Conclusions:** Synkinesis etiology, time from synkinesis onset to SN, and number of branches lysed during SN are not predictors for recurrence. Adjuvant facial rehab therapy trended towards significance for decreased recurrence, and we advocate for rehab as part of a holistic treatment algorithm for synkinesis.

1:43 **Longer Operative Time as a Predictor of Facial Fracture Repair Complications**

Parisorn Thepmankorn, BS, Newark, NJ; Chris B. Choi, BS, Newark, NJ; Aakash Shah, BS, Newark, NJ; Aksha Parray, BA, Newark, NJ; Boris Paskhover, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the association between operative time and rates of postoperative complications in patients undergoing facial fracture repair.

Objectives: To investigate the association between longer operative time and rates of postoperative complications in patients undergoing facial fracture repair. **Study Design:** Retrospective database review. **Methods:** The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) databases from 2005-2015 were reviewed, selecting for all patients undergoing facial fracture repair. Chi squared analysis and multivariate logistic regression were used to assess the independent effect of covariates on postoperative complication rates. **Results:** 3,575 patients who underwent facial fracture repair with known operative time were identified. The median operative time, 97 minutes, was used to subdivide the patients into two cohort groups: ≤97 minutes and >97 minutes. Univariate analysis of demographic variables revealed that being Black (p=0.002) or male (p<0.001) were associated with longer operative time. Univariate analysis of preoperative comorbidities revealed that an American Society of Anesthesiologists classification of class III or IV (p=0.010) and diabetes mellitus (p=0.027) were associated with longer operative time. Univariate analysis of postoperative complications revealed that longer operative time was significantly associated with increased bleeding (p<0.001), an unplanned readmission (p=0.013), and experiencing a surgical complication (p<0.001). Multivariate regression analysis found that longer operative time was significantly associated with increased surgical complications (odds ratio [OR] 2.886, 95% CI 1.414-5.893, p=0.004) and overall postoperative complications (OR 2.356, 95% CI 1.278-4.343, p=0.006). **Conclusions:** This study reveals that longer operative time, a common clinical parameter, is associated with increased odds of postoperative complications of facial fracture repair. Prolonged operative time may serve as a quality indicator for facial fracture repairs.

1:50 - 1:55 **Moderator Wrap Up/Q&A**

1:55 - 2:05 ***Break***

2:00 - 3:00 ***Chat Lounge Open***

2:05 - 2:50 **FACIAL PLASTICS PANEL: CONTROVERSIES IN FACIAL PLASTICS**
Moderators:
Philip Daniel Knott, MD, San Francisco, CA
Panelists:
Jose E. Barrera, MD FACS, San Antonio, TX
Lisa E. Ishii, MD MHS, Baltimore, MD
Tom D. Wang, MD FACS, Portland, OR

2:45 - 2:50 **Moderator Wrap Up/Q&A**

2:50 - 3:20 ***POSTER SESSION - VISIT WITH PRESENTERS (LIVE SESSION)***

3:20 - 4:05 General Session

3:20 - 4:05 **PANEL: LESSONS LEARNED FROM THE COVID PANDEMIC**
Moderator:
Eric W. Wang, MD FACS, Pittsburgh, PA
Panelists:
Guiding the Otolaryngologist: AAOHNS's Response to Covid19
Ken Kazahaya, MD MBA FACS, Philadelphia, PA
Covid and Aerosol Generating Procedures: What Is the Evidence?
Benjamin S. Bleier, MD FACS, Boston, MA
Covid Risks and In-Office Procedures
Adam M. Zanation, MD, Chapel Hill, NC
Residency Training During the Covid Era
Liana Puscas, MD MHS MA FACS, Durham, NC

4:00 - 4:05 **Moderator Wrap Up/Q&A**

4:05 - 4:25 ***VISIT EXHIBITORS (LIVE SESSION)***

4:25 - 5:55 Concurrent Session C1

Laryngology/Bronchoesophagology

4:25 - 5:10 **LARYNGOLOGY PANEL: COVID PATIENTS - MANAGEMENT POST-INTUBATION AND ISSUES AROUND TRACHEOTOMY**

Moderator:

Alexander Gelbard, MD, Nashville, TN

Panelists:

Michael M. Johns III, MD, Los Angeles, CA
Laura A. Matrka, MD, Columbus, OH
Julina Ongkasuwan, MD, Houston, TX
Michael J. Pitman, MD, New York, NY

5:05 - 5:10 **Moderator Wrap Up/Q&A**

5:10 - 5:20 ***Break***

Moderator: Karen M. Kost, MD, Montreal, QC Canada

5:20 **Anesthesia Recovery Times for Patients with and without Obstructive Sleep Apnea: Inhalational Anesthesia versus Total Intravenous Anesthesia**

Emily Sagalow, BS, Philadelphia, PA; Matthew Stewart, BS, Philadelphia, PA; Leonard Estephan, BS, Philadelphia, PA; Adam Thaler, DO, Philadelphia, PA; Maurits Boon, MD, Philadelphia, PA; Colin Huntley, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the benefit of total intravenous anesthesia (TIVA) in obstructive sleep apnea (OSA) patients.

Objectives: To determine if there is a recovery time difference between obstructive sleep apnea (OSA) patients and non-OSA patients when using total intravenous anesthesia (TIVA) and inhalational anesthesia in the form of sevoflurane. **Study Design:** Retrospective chart review. **Methods:** OSA and non-OSA patients were identified at a single tertiary institution between January 2019 to July 2020. Non-OSA patients were defined as those who have not been formerly diagnosed with OSA; a modified STOP-BANG score was performed for these patients. Recovery was measured by phase I recovery time, or the time it took a patient to reach ≥ 9/10 on the Aldrete scoring system. Only patients with operative times ≥ 60 minutes were included. **Results:** One hundred and thirty-eight OSA patients (58 TIVA, 80 sevoflurane) and 116 non-OSA patients (89 TIVA, 27 sevoflurane) were identified. In OSA patients, there was a 45 minute reduction in recovery time when using TIVA versus sevoflurane ($p=.006$), whereas non-OSA patients with STOP-BANG score <3 had a statistically insignificant reduction of 18.3 minutes between TIVA and sevoflurane ($p=1.0$). When comparing recovery times using TIVA between OSA patients to non-OSA patients with STOP-BANG <3, the non-OSA cohort recovered faster by 66.3-minutes ($p<0.0001$); similarly, for sevoflurane, the non-OSA cohort recovered faster than the non-OSA cohort by 93-minutes ($p<0.0001$). **Conclusions:** When utilizing TIVA over inhalational anesthesia, patients with OSA have significantly increased benefit in terms of reduced phase I recovery times. Overall, patients with OSA have longer recovery times compared to non-OSA patients.

5:27 **Delineating the Risk Factors for Dysphagia in Stroke Patients**

Samer T. Elsamna, BA, Newark, NJ; Ghayoour Mir, DO, Newark, NJ; Rachel Kaye, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to determine what stroke patient characteristics whether clinical or not predispose them to developing dysphagia.

Objectives: Dysphagia is a serious condition that has an impact on patients' quality of life, clinical outcomes, institutionalization, and mortality. As the leading cause of dysphagia are strokes, we sought to utilize a large sample population database to investigate the impact of clinical and nonclinical factors on the risk of developing dysphagia in patients with a history of stroke. **Study Design:** Data was acquired from the National Inpatient Sample (NIS) database with cases from 2008-2013. In cases with a primary hospital admitting diagnosis of dysphagia, patient characteristics, morbidities, and procedures were assessed. **Methods:** Odds ratios (OR) were obtained through logistic regression

analyses of stroke cases. The Bonferroni correction was applied for the multivariate regression. **Results:** There were 2,057,646 extracted stroke cases that were divided into dysphagia (n=989) and non-dysphagia (n=2,056,657) cohorts. Factors associated with increased risk for dysphagia included male gender (OR: 1.34), age >60 (OR: 2.37), head and neck radiation (OR: 2.33), other radiation (OR: 6.32), and congestive heart failure (OR: 1.27). Factors associated with a reduced risk included atrial fibrillation (OR: 0.56), carotid stenosis (OR: 0.28), hyperlipidemia (OR: 0.62), obesity (OR 0.39), and tobacco use (OR: 0.77). With elderly (>80) patients as reference, younger patients were seen to have less of a risk. **Conclusions:** A large patient sample population was utilized to delineate factors associated with an increased or decreased risk of dysphagia in stroke patients. Male gender, older age, radiation, and congestive heart failure were associated with increased risk while atrial fibrillation, carotid stenosis, hyperlipidemia, obesity, and tobacco use, were associated with a decreased risk.

5:34 **A Systematic Review of In-office Serial Steroid Injections as a Treatment for Subglottic Stenosis**
Alyssa Nicole Ayala, MS, Oakland, CA; Nancy Jiang, MD, Oakland, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe how in-office serial steroid injections are beneficial to individuals with subglottic stenosis.

Objectives: In-office serial steroid injections (ISSI) are a novel approach to treating subglottic stenosis (SGS) or tracheal stenosis. We aim to develop a consensus about the effectiveness of ISSI as a treatment for SGS. **Study Design:** Systematic review. **Methods:** Review is written according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Databases were searched for abstracts that met inclusion criteria. Inclusion criteria were adults with subglottic or tracheal stenosis that received ISSI. Exclusion criteria were patients younger than 18 years old, stenosis in a different airway location, or no mention of serial steroid injections. A meta-analysis was conducted on three papers that reported surgery free interval (SFI). **Results:** We identified five articles consisting of 85 total subjects. The combined SFI was an average increase of 7.05 months with a 95% confidence interval (CI) of 2.7 to 11.38 months. Patients rated the pain of ISSI before, during, and after the procedure as 0.1 ± 0.5, 2.3 ± 1.7, and 0.9 ± 1.3, respectively, using the Faces Pain Scale. Patients also reported a decrease in dyspnea with a reduction from 14.0 ± 9.75 to 3.0 ± 11.8 using the Dyspnea Index (DI), and a reduction from 1.0 ± 1.3 to 0.0 ± 1.0 on the Modified Medical Research Council (MMRC) dyspnea scale. Increase in peak expiratory flow (%PEF) was similar between two groups that received either ISSI alone (23.1%) or as an adjuvant to surgery (25.1%). **Conclusions:** ISSI significantly increased the SFI in patients with SGS. The procedure was also well tolerated and decreased dyspnea. The %PEF increase was the similar between groups that received ISSI alone or ISSI with surgery.

5:41 **HARRIS P. MOSHER 2020 THESIS AWARD**
HPV11 and Young Age at Diagnosis Are Independently Associated with Pulmonary Involvement in Recurrent Respiratory Papillomatosis
Farrel J. Buchinsky, MBChB BSc FACS, Pittsburgh, PA

5:48 **EDMUND PRINCE FOWLER 2020 THESIS AWARD**
The Proximal Airway is a Reservoir for Adaptive Immunologic Memory in idiopathic Subglottic Stenosis
Alexander Gelbard, MD, Nashville, TN

5:55 - 6:00 **Moderator Wrap Up/Q&A**

6:00 **Closing Remarks**
David E. Eibling, MD FACS, Pittsburgh, PA (Eastern Section Vice President)

6:05 - 6:15 ***Break***

6:15 - 7:30 **THE WORLD FAMOUS RESIDENT BOWL**

7:30 **Adjourn**

4:25 - 6:00 Concurrent Session C2
Otology/Neurotology

Moderator: J. Walter Kutz, MD FACS, Dallas, TX

4:25 **Neuroanatomic Volume Differences in Tinnitus and Hearing Loss**
Andrew Yousef, MD, San Francisco, CA; Leighton B. Hinkley, PhD, San Francisco, CA; Srikantan S. Nagarajan, PhD, San Francisco, CA; Steven W. Cheung, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand what neuroanatomical volume differences are seen in patients with tinnitus and/or hearing loss.

Objectives: To investigate neuroanatomic volume differences in tinnitus and hearing loss. **Study Design:** Cross-sectional. **Methods:** Sixteen regions of interest (ROI) in adults (43 male, 29 female) were examined using 3 Tesla structural MRI in 4 cohorts: 1) tinnitus with moderate hearing loss (N=31); 2) moderate hearing loss only (N=15); 3) tinnitus with normal hearing (N=17); and 4) normal hearing only (N=13). ROI volumes were corrected for brain size, age, and sex variations. Analysis of covariance (ANCOVA) and post-hoc Tukey Test were used to isolate the effects of tinnitus and hearing loss on volume differences. Effect sizes were calculated as the fraction of total variance (Ƞ2) in ANCOVA models and percent of mean volume difference relative to mean total volume. **Results:** Compared to the normal hearing only cohort, omnibus ANCOVA revealed tinnitus and hearing loss cohorts to have larger volumes in corona radiata (Ƞ2=0.192; p=0.0018) and smaller volumes in nucleus accumbens (Ƞ2=0.252; p<0.0001), caudate nucleus (Ƞ2=0.188; p=0.002), and inferior fronto-occipital fasciculus (Ƞ2=0.250; p=0.0001). Tinnitus with normal hearing showed smaller volumes in nucleus accumbens (22.0%; p=0.001) and inferior fronto-occipital fasciculus (18.1%; p=0.002), and hearing loss only showed larger volumes in corona radiata (10.7%; p=0.01) and smaller volumes in nucleus accumbens (22.1%; p=0.001), caudate nucleus (16.1%; p=0.004) and inferior fronto-occipital fasciculus (18.3%; p=0.003). **Conclusions:** While tinnitus and hearing loss have overlapping effects on neurovolumetric alterations, the tinnitus specific effect of smaller volume is found in nucleus accumbens and inferior fronto-occipital fasciculus. It is imperative that tinnitus related volumetric reporting account for hearing loss contribution explicitly.

4:32 **Efficacy of Topical Epinephrine in Tympanoplasty**
Marna A. List, BS, Gainesville, FL; Carolyn O. Dirain, PhD, Gainesville, FL; Patrick J. Antonelli, MD, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to objectively review their own topical epinephrine practices and determine if modification to lower concentrations is warranted.

Objectives: To compare vasoconstriction and hemodynamic effects of two common concentrations of topical epinephrine in otologic surgery. **Study Design:** Prospective, controlled, double blinded study of tympanoplasty. **Methods:** Patients were randomized to receive topical epinephrine at 1:1,000 or 1:10,000. Hemostasis was assessed with a modified Boezaart scale. Vasoconstriction was measured by laser doppler. Blood pressure and pulse were tracked before and after topical epinephrine exposure. **Results:** Thirty patients, 4 - 84 years old, were studied, with 15 patients per group. Boezaart scores dropped an average of 67% and 62% for 1:1,000 and 1:10,000, respectively (p=0.44). Capillary blood flow by laser doppler decreased an average of 50.4% and 50.9% for 1:1,000 and 1:10,000 respectively (p=0.95). The mean change in heart rate and mean arterial pressure after topical epinephrine exposure were 2.5 and 2 (p=0.73), and 0.74 and -0.48 (p=0.52) for 1:1,000 and 1:10,000 respectively. **Conclusions:** Topical epinephrine at 1:10,000 has comparable efficacy to 1:1,000 in tympanoplasty. Use of lower concentrations of topical epinephrine should be favored to minimize the potential for adverse events associated with more concentrated topical epinephrine.

4:39 **Cost Burden of Common Otic Drops in Our Area**
Ezer Haim Benaim, BA, Memphis, TN; T. Michael Bone, MD, Memphis, TN; Thomas Iorio, BS, Memphis, TN; C. Bruce MacDonald, MD MS, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the cash price of otic drops, consider alternative cheaper medications if appropriate, and understand which factors contribute to variability among otic drop prices.

Objectives: To evaluate the cost burden of various otic drops and compare price differences between various zip codes across our area. **Study Design:** Descriptive study comparing out of pocket costs of three common otic drops and three

ophthalmic drops which are commonly used "off-label" for otologic disease. **Methods:** Thirteen regional zip codes throughout our metropolitan area and surrounding states were included and stratified by income bracket. Four of the largest retail pharmacies and all local pharmacies were personally called at each of these zip codes, fifty-six pharmacies in total. Discounted prices from GoodRx were also included from chain pharmacies. The average price and average price per milliliter were calculated for three common otic drops, and three common ophthalmic drops. **Results:** Brand Ciprodex was the most expensive medication recorded as high as $43.32/mL. Ofloxacin otic drops had the largest variability between chain and local pharmacies ($30.75/mL vs. $6.20/mL). GoodRx discounts were generally significant and at most resulted in a 4 fold discount for ofloxacin otic ($30.75/mL vs $7.14/mL). Ciprofloxacin ($3.46/mL) and dexamethasone ($10.99/mL) ophthalmic drops combined were 3 fold less expensive than Ciprodex ($37.21/mL). Ofloxacin ophthalmic ($5.78/mL) was 3 fold less expensive than ofloxacin otic ($14.70/mL). Lower income zip codes showed slightly lower prices in general. **Conclusions:** Large differences in prices are seen between chain and independent pharmacies, ophthalmic versus otic formulations, and brand versus generic medications. This study provides a useful tool for improving clinician awareness of cost burden for uninsured patients as well as providing cheaper alternatives if clinically appropriate.

4:46 **Changes in Endolymphatic Hydrops on MRI over Time and after Medical or Surgical Treatment: A Systematic Review**

Maria A. Mavrommatis, BA, New York, NY; Vivian F. Kaul, MD, New York, NY; Kevin Chow, BA, Houston, TX; Enrique Perez, MD MBA, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe changes in endolymphatic hydrops (ELH) over time without treatment, and after medical and surgical treatment, as well as report post-treatment symptomatic outcomes.

Objectives: The pathophysiology of Meniere's disease (MD) involves endolymphatic hydrops (ELH) of the inner ear. Magnetic resonance imaging (MRI) has been shown to detect ELH, but changes in ELH have been poorly described using this modality. Our objective was to review MRI measured changes in ELH over time and after treatment. **Study Design:** Systematic literature review. **Methods:** A systematic review of articles in Embase and Medline was performed to identify studies utilizing MRI to measure ELH changes over time and after medical or surgical treatment. **Results:** Of 532 studies identified, 19 were ultimately included, involving 192 patients (mean age 51.7 years). 11 studies were prospective, three were retrospective, and five were case reports. In the two studies observing changes in ELH over time without treatment, 83.3% of patients exhibited the same or increased ELH over an average of 2.2 years, and the number of involved sites in the vestibulocochlear systems increased with time. Across the nine studies investigating medical management with steroids, diuretics, or betahistine, 16.6% of patients demonstrated a reduction of ELH. In the nine studies considering surgical management with intratympanic gentamicin or endolymphatic sac surgery, 25.5% of patients demonstrated a reduction of ELH postoperatively. Across all interventions, 68.8% of patients exhibited the same or worsening ELH. In studies reporting vertigo outcomes, 85.3% of patients exhibited improvement after the treatment period. **Conclusions:** Medical and surgical interventions often yield symptomatic relief of vertigo in MD patients despite stable or increasing ELH volume. MRI likely has greater clinical utility in diagnosing ELH as opposed to assessing treatment response.

4:53 **Middle Ear Squamous Cell Carcinoma: A Population Based Analysis**

Ghayoour S. Mir, DO, Newark, NJ; Chris B. Choi, BS, Newark, NJ; Samer T. Elsamma, BA, Newark, NJ; Tapan D. Patel, MD, Newark, NJ; Yu-Lan M. Ying, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to describe patient characteristics, treatment modalities, and their disease specific survival concerning middle ear squamous cell carcinoma.

Objectives: Middle ear squamous cell carcinoma (ME-SCC) is a rare malignant neoplasm that has continued to have a dismal outcome despite advances in technology. This study analyzes the demographic, clinicopathologic, and survival characteristics of this rare tumor. **Study Design:** Retrospective database review. **Methods:** The SEER database was queried for ME-SCC cases from 1973 to 2017. Data analyzed included patient demographics and survival outcomes using frequency functions and Kaplan-Meier models. **Results:** 238 patients with ME-SCC were extracted from SEER. ME-SCC occurred most frequently in the sixth and seventh decades of life. There was a slight male predilection with a male-to-female ratio of 1.33:1. The majority of cases are regional in metastasis at the time of presentation (42.4%) and 18.1% of the patients were localized. Most ME-SCC histological grades were I and II (60.9%). The most common treatment modality was surgery with radiotherapy (41.6%), surgery alone (30.3%), and neither surgery nor radiotherapy (26.9%). Survival analysis showed poor 5 year and 10 year disease specific survival rates (29.0% and 20.0%, respectively). 5 year disease specific survival was better among those who were treated with only surgery (46.6%) than surgery with radiotherapy (22.7%), (p=0.004). 10 year disease specific survival was also better among those were treated with only surgery (38.6%) than surgery with radiotherapy (14.7%), (p<0.001). **Conclusions:** This study represents the largest cohort of ME-SCC cases to date. It is the most common histologic neoplasm in the middle ear associated with the poorest overall survival. Surgery only treatment modality increases disease specific survival.

5:00 - 5:05 **Moderator Wrap Up/Q&A**

5:05 - 5:15 ***Break***

5:15 - 6:00 **OTOLOGY/NEUROTOLOGY PANEL: MANAGEMENT OF SUDDEN HEARING LOSS**
Moderator:
Sujana S. Chandrasekhar, MD FACS, New York, NY
Panelists:
Yuri Agrawal, MD, Baltimore, MD
D. Bradley Welling, MD PhD FACS, Boston, MA
Brian D. Westerberg, MD, Vancouver, BS Canada

5:55 - 6:00 **Moderator Wrap Up/Q&A**

6:00 **Closing Remarks**
David E. Eibling, MD FACS, Pittsburgh, PA (Eastern Section Vice President)

6:05 - 6:15 ***Break***

6:15 - 7:30 **THE WORLD FAMOUS RESIDENT BOWL**

7:30 **Adjourn**

POSTERS

Allergy/Rhinology

1. Unanticipated Admission after Outpatient Endoscopic Sinus Surgery

Gregory L. Barinsky, PharmD, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Jordon G. Grube, DO, Newark, NJ; Wayne D. Hsueh, MD, Newark, NJ; Richard C. Park, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to describe factors that may be associated with an increased risk of unplanned admission following elective outpatient endoscopic sinus surgery.

Objectives: To identify factors that may increase the risk of unplanned admission following elective outpatient endoscopic sinus surgery (ESS). **Study Design:** Retrospective analysis of the National Surgical Quality Improvement Program (NSQIP). **Methods:** All cases of ESS were extracted from the 2010-2018 NSQIP database using current procedural terminology codes. Only cases that were coded as outpatient, elective, and nonemergent procedures were included. Unplanned admissions were defined as cases with a total hospital stay of greater than 0 days. Univariate and multivariate analysis was performed to identify variables that independently predicted unanticipated admission. **Results:** A total of 971 cases met inclusion criteria, of which 274 (28.2%) were unanticipated admissions. Patients in the unplanned admission group were more likely to be older (46.8 vs 41.1 years, p<0.001), male (57.7% vs 48.4%, p=0.009), obese (54.8% vs 43.8%, p=0.003), and hypertensive (35.0% vs 25.0%, p=0.002). Admitted patients were also more likely to be ASA classification III-IV (43.1% vs 27.2%, p<0.001). There were no significant differences in race, smoking, diabetes, or chronic steroid use. Admitted patients had a higher rate of surgical complications (2.9% vs 1.0%, p=0.041). Upon multivariate analysis, independent preoperative risk factors for unplanned admission included age (OR: 1.018, p=0.002), male gender (OR: 1.415, p=0.025), obesity (OR: 1.527, p=0.008), and ASA III-IV (OR 1.501, p=0.018). **Conclusions:** Factors independently associated with unplanned admission following outpatient ESS were older age, male gender, obesity, and higher ASA classification. Preoperative identification of patients at risk may help reduce the burden of unanticipated hospital admission after ESS.

2. Is Frailty or Advanced Age a Better Predictor of Complications in Patients Undergoing Endoscopic Transsphenoidal Resection of Benign Pituitary Neoplasm

Chris B. Choi, BS, Newark, NJ; Aksha Parray, BA, Newark, NJ; Aakash Shah, BS, Newark, NJ; Michael Hegazin, DO, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to investigate the association between modified frailty index and post-surgical outcomes and mortality rates in patients undergoing endoscopic transsphenoidal surgery for benign neoplasm of the pituitary gland. To also stratify cohorts by their modified frailty index scoring and assess if varying scores are statistically associated with variations in outcomes and to compare frailty index scoring in its association with post-surgical outcomes and mortality when compared to advanced age.

Objectives: Complications in patients undergoing endoscopic transsphenoidal surgery for benign neoplasm of the pituitary gland. **Study Design:** Retrospective database review. **Methods:** The 2005-2015 National Surgical Quality Improvement Program (NSQIP) database was used to identify patients that underwent endoscopic transsphenoidal surgery for benign neoplasm of the pituitary gland using ICD-9 codes in conjunction with current procedural timing coding for surgical approach. The five factor modified frailty index (mFI-5) score was calculated on 5 comorbidities: congestive heart failure within 30 days prior to surgery, insulin or noninsulin dependent diabetes mellitus, COPD or pneumonia, partially dependent or totally dependent functional health status, and hypertension requiring medication. Univariate analysis and multivariate regression were used to assess the independent impact of increasing mFI-5 score and age on postoperative morbidity, controlling for baseline characteristics. Propensity score matching homogenized the cases. **Results:** 1097 patients were identified. mFI-5 score of 2 or more demonstrated a statistically significant increased likelihood of experiencing surgical complications (OR: 2.259, CI 95% 1.058-4.822, p=0.035). Age was not found to be associated with complications except for significantly increased likelihood of post-surgical blood transfusion complication (OR:1.035 CI 95% 1.001-1.070, p=0.041). Increased mFI-5 score was not found to demonstrate a significantly increased likelihood of post-surgical bleeding complications. **Conclusions:** Modified frailty index score of 2 or more was found to demonstrate an increased likelihood of surgical wound complications and more accurate predictor of complications compared to advanced age.

3. Impact of Surgical Margin Status on Survival following Resection of Sinonasal Mucosal Melanoma

Samer T. Elsamna, BA, Newark, NJ; Ghayoour Mir, DO, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Michael Hegazin, DO, Newark, NJ; Soly Baredes, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to describe patient characteristics, treatment modalities, and the impact of surgical margin status on survival of sinonasal mucosal melanoma.

Objectives: Sinonasal mucosal melanoma (SMM) is an aggressive cancer with poor prognosis that is usually managed with surgical resection. This study evaluates the impact of treatment modality and positive surgical margin (PSM) status on survival following resection of SMM. **Study Design:** Retrospective study of a national cancer registry. **Methods:** The National Cancer Database was queried for cases of SMM from 2010 to 2015. Data regarding patient demographics, tumor staging, treatment modality were obtained. Survival rates were compared by margin status: PSM, negative surgical margin (NSM), and no surgery (NS) using ANOVA analysis. **Results:** 446 patients met inclusion criteria. Most cases were elderly (> 66 years-old) (67.3%), female (54.3%), and white (89.5%). Cases of SMM most commonly involved the nasal cavity (81.6%), were stage 3 (60.0%), and underwent surgical resection at an academic center (65.0%). NSM and PSM were achieved in 59.0% and 26.9% of cases, respectively, while 14.1% of cases did not undergo surgery. Factors predictive of a PSM included resection at a community hospital (OR 2.47, 95%CI 1.53-3.98) and stage 3 disease (OR 2.07, 95% CI 1.26-3.4). Two year overall survival rates were 61.0% (95% CI 0.55-0.67), 37.0% (95% CI 0.28-0.45), and 22.0% (95% CI 0.12-0.33) for NSM, PSM and NS, respectively. **Conclusions:** Our study emphasizes the need for clear surgical margins for SMM as PSM did not demonstrate any significant improvement in survival when compared to NS. These findings suggest that cases of SMM should be referred to academic centers given the complexity of surgical excision and management.

4. Complication Risk in Ventral Skull Base Surgery Based on Preoperative Hematocrit

Liam Sean Flanagan, BS, Newark, NJ; Chris B. Choi, BS, Newark, NJ; Aakash Shah, BS, Newark, NJ; Aksha Parray, BA, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to investigate and discuss the importance of preoperative hematocrit as it relates to complication risks and length of stay in ventral skull base surgical procedures.

Objectives: Preoperative anemia has been shown to be a predictor of complications in patients undergoing sinus surgery. This has not been exclusively studied in skull base surgery. This study investigates the impact of preoperative hematocrit on complications following ventral skull base surgery. **Study Design:** Retrospective database review. **Methods:** The National Surgical Quality Improvement Program was queried for all cases of ventral skull base surgery from 2005 to 2015. Univariate and multivariate analyses were performed to investigate the impact of preoperative anemia on complications following ventral skull base procedures. **Results:** 1792 patients meeting inclusion criteria were identified. On univariate analysis, low hematocrit was found in 37.6% of patients and was associated with increased mean age (55.47 years vs. 53.80 years), male gender (59.2% vs. 39.1%), and Black race (18.7% vs. 11.4%). Preoperative anemia was also associated with increased rates of postoperative pneumonia, extended ventilator requirements, blood transfusions, sepsis, septic shock, medical complications, surgical complications, extended length of hospital stay, and mortality. On multivariate analysis, associations between low preoperative hematocrit and perioperative transfusions (OR 2.927, 95% CI 2.176-3.938, $p<0.001$), sepsis (OR 2.347, 95% CI 1.085-5.077, $p=0.030$), total surgical complications (OR 2.486, 95% CI 1.889-3.273, $p<0.001$), and extended length of hospital stay (OR 1.500, 95% CI 1.177-1.913, $p=0.001$) remained significant. **Conclusions:** Low preoperative hematocrit is associated with increased risk of postoperative complications and extended length of hospital stay in patients undergoing ventral skull base surgery. This study highlights the importance of careful preoperative assessment and management of anemia in these patients.

5. MELD-Na Score as a Predictor of Postoperative Complications in Ventral Skull Base Surgery

Liam Sean Flanagan, BS, Newark, NJ; Chris B. Choi, BS, Newark, NJ; Aksha Parray, BA, Newark, NJ; Aakash Shah, BS, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to investigate the association between liver health and complications of ventral skull base surgical procedures.

Objectives: The Model for Endstage Liver Disease-Sodium (MELD-Na) Score was designed for chronic liver disease prognosis and has been associated with poorer outcomes in a variety of procedures. Few studies have investigated its utility

in head and neck surgery. This study uses the MELD-Na score to investigate the association between liver health and ventral skull base surgical complications. **Study Design:** Retrospective database review. **Methods:** The National Surgical Quality Improvement Program database was used to identify patients who underwent ventral skull base procedures between 2005 and 2015. Univariate and multivariate analyses were performed to investigate the association between elevated MELD-Na score and postoperative complications. **Results:** 740 patients undergoing ventral skull base surgery with lab values required to calculate the MELD-Na score were identified. The mean age was 55.1 years. The mean MELD-Na score was 8.03. Univariate analysis showed that elevated MELD-Na score was significantly associated with increased age (59.8 vs. 54.4 years) and male gender (73.3% vs. 46.0%). Elevated MELD-Na score was associated with increased rates of postoperative pneumonia, extended ventilator needs, acute renal failure, transfusion, septic shock, medical and surgical complications, extended length of hospital stay, and mortality. On multivariate analysis, associations between elevated MELD-Na and increased risk of postoperative pneumonia (OR 2.934, 95%CI 1.302-6.612, p=0.009), perioperative transfusion (OR 2.004, 95%CI 1.184-3.392, p=0.010), and surgical complications (OR 1.897, 95%CI 1.138-3.163, p=0.014) remained significant. **Conclusions:** This analysis points to an association between liver health and postoperative complications in ventral skull base surgery. Future research investigating this question is warranted.

6. Malignant Peripheral Nerve Sheath Tumor with Neuroendocrine Differentiation of the Sphenoid Sinus: A Rare Pathology

Alexa M. Franco, MD, New York, NY; Anna Frants, MD, New York, NY; Cheng Liu, MD, New York, NY; Seth M. Lieberman, MD, New York, NY; Marc Gottlieb, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the rarity of malignant peripheral nerve sheath tumors (MPNST) of the sphenoid sinus, especially with neuroendocrine differentiation which has not been previously described in the literature. Furthermore, the participants should be able to understand the presentation, diagnosis, and management of MPNST of the head and neck.

Objectives: (1) Present a case of a patient with sphenoid sinus malignant peripheral nerve sheath tumor (MPNST) with neuroendocrine differentiation, not previously described in the literature; and 2) review the literature regarding MPNST in the head and neck, a rare clinical entity. **Study Design:** Case report. **Methods:** Examination of medical records; literature review. **Results:** A 74 year old female patient presented to an ophthalmologist with four weeks of vision loss in her left eye, proptosis, and left third and sixth cranial nerve palsies. Her symptoms were associated with bilateral nasal congestion and intermittent epistaxis. MRI of the brain and sinuses revealed a 5.3 x 6.4 x 6.4 cm heterogeneously enhancing mass centered at the left skull base/sphenoid sinus extending into the sinonasal cavity, orbit, pterygopalatine fossa, masticator space, and middle cranial fossa. Endoscopic endonasal biopsy of the tumor revealed a high grade malignant neoplasm, consistent with MPNST and a heterologous component with neuroendocrine epithelial differentiation. Given the unresectability of the tumor, radiation therapy versus induction chemotherapy and radiation was recommended by a multidisciplinary tumor board. **Conclusions:** MPNST are exceedingly rare soft tissue sarcomas with only 10-12% presenting in the head and neck. About 15% of MPNSTs demonstrate heterologous differentiation, such as rhabdomyoblasts, smooth muscle, bone, and neuroendocrine components. Albeit rare, MPNST should be considered on the differential for sinonasal tract lesions. There have only been a few case reports of MPNST arising from the nasal cavity or paranasal sinuses. Furthermore, to our knowledge, this is the first reported case of a MPNST in the head and neck with neuroendocrine differentiation.

7. A National Cancer Database Analysis of Prognostic Factors and Survival among Racial Groups in Nasopharyngeal Carcinoma

Zhuojun Guo, PhD, Newark, NJ; Christopher James Didzbalis, BA, Newark, NJ; Aatin K. Dhanda, BA, Newark, NJ; Sara Behbahani, MS, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to describe differences in demographics, treatment, and clinical outcomes of different racial groups with NPC.

Objectives: Nasopharyngeal carcinoma (NPC) is a malignancy that arises from the epithelia of the nasopharynx with a high prevalence among Asians. We aim to describe differences in demographics, treatment, and clinical outcomes of different racial groups with NPC. **Study Design:** Database study. **Methods:** 11,578 NPC cases were identified in the National Cancer Database from 2004 to 2016. Chi square analyses, Kaplan-Meier, and Cox proportional hazard models were performed to analyze prognostic variables. **Results:** Whites represented 66.75% of NPC patients; followed by Blacks (15.5%), East Asians (6.9%), Southeast Asians (5.4%), and South Asians (1.1%). Whites were diagnosed with NPC at an older age (58.1 ± 13.9) than Blacks (51.4 ± 16.6), East Asians (51.7 ± 13.7), Southeast Asians (52.3 ± 13.1), and South Asians (52.5 ± 14.3). The majority of Whites (65.3%) and Blacks (57.3%) were diagnosed with keratinizing squamous histology, compared with East Asians (29.8%), Southeast Asians (36.4%), and South Asians (33.6%) ($p<0.001$). Five year overall survival (OS) was higher for East Asians (71.2%) and South Asians (75.6%) compared to Whites (49.6%), Blacks (51.4%), and Southeast Asians (59.8%) ($p<0.001$). When adjusting for age, gender, tumor grade, stage, regional nodal

spread, histology, Charlson-Deyo comorbidity score, insurance status, and treatment, Cox regression demonstrated that East Asian race (ref: whites; HR 0.669, 95% CI [0.554-0.808], p<0.001) was independently associated with improved OS. **Conclusions:** In patients with NPC, East Asian race is independently associated with better OS. More studies are needed to further evaluate clinical presentation and outcomes by race in NPC.

8. Endoscopic Sinus Surgery in Older Patients with Significant Medical Comorbidities

Ryan J. Huang, BA, Durham, NC; Jordan Teitelbaum, DO, Durham, NC; Khalil Issa, MD, Durham, NC; Tracy Truong, MS, Durham, NC; David W. Jang, MD, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the outcomes of endoscopic sinus surgery (ESS) for chronic rhinosinusitis (CRS) in older patients with significant medical comorbidities.

Objectives: ESS offers excellent outcomes for patients with CRS in the general population. The purpose of this study is to evaluate whether older patients with significant medical comorbidities experience improvements in quality of life (QOL) after ESS without a greater incidence of perioperative complications. **Study Design:** This is a retrospective study of CRS patients 55 years or older who underwent elective ESS at an academic institution from July 2017 to June 2019. **Methods:** 22 Item Sinonasal Outcomes Test (SNOT-22) scores were gathered at baseline and at three months after surgery. Data on demographics, medical comorbidities, and postoperative complications were extracted from the medical record. Patients were stratified into two groups based on the Charlson Comorbidity Index (CCI). **Results:** 210 patients met inclusion criteria. 169 patients were in the low CCI group (score: 0 to 3), while 41 patients were in the high CCI group (score: 4 or more). Mean followup was 87.7 days. Rates of asthma and nasal polyposis were comparable between the groups. Although the high CCI group had a higher rate of unplanned 30 day readmission (7.3% vs 0.6%, p = .024), there was no significant difference in mortality or return to OR rates. For SNOT-22 scores, both the low CCI group (38.3 ± 20.7, 21.5 ± 19.0) and the high CCI group (42.1 ± 25.8, 22.4 ± 18.4) had significant improvements (p < .001), without a significant difference between the two groups. **Conclusions:** For older patients with significant medical comorbidities, ESS is a safe and effective treatment option in the management of CRS. A multidisciplinary approach to perioperative care is critical in maintaining the safety and efficacy of ESS in this vulnerable patient population.

9. Healthcare Utilization for Chronic Rhinosinusitis in the Elderly

David Jang, MD, Durham, NC; Ryan Huang, BS, Durham, NC (Presenter); Hui-Jie Lee, PhD, Durham, NC; Charles Scales, MD, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss healthcare utilization and expenditure for chronic rhinosinusitis in older adults.

Objectives: With the growth of the aging population in the United States, the cost burden of chronic conditions in older adults is important to assess. Chronic rhinosinusitis (CRS) is a common and costly health problem that affects the elderly. Therefore, the objective of this study is to characterize healthcare resource utilization (HCRU) and healthcare expenditure (HCE) for CRS in this population. **Study Design:** Retrospective review of administrative database. **Methods:** Patients meeting criteria for CRS with three years of continuous data were identified on IBM Marketscan Research Databases over a five year period (2013-2017). Patients were analyzed according to four age groups: pediatric (65). Medication utilization, outpatient visits, surgery, immunotherapy, and expenditures related to CRS were compared. Multivariable generalized linear models were utilized to compare HCE while adjusting for baseline medication utilization. **Results:** 238,825 patients met inclusion criteria. Older adults had the highest overall prevalence of nasal polyps (10%) and asthma (16%) among adult groups. Surgery rate was lower than other adult groups, but medication utilization, particularly antibiotics, was the highest. Mean overall HCE at two years was highest in older adults ($2545 vs. $2298 in young adults). However, HCE decreased substantially after adjusting for baseline medication usage. **Conclusions:** Older adults had a higher rate of CRS related comorbidities, along with the highest CRS related medication utilization and HCE. The cost of CRS is likely to increase in the United States as the aging population grows. Potential strategies for reducing cost include addressing polypharmacy and promoting antibiotic stewardship.

10. Factors Associated with Under- and Over-Reporting Smell and Taste Dysfunction

Sophie S. Jang, MS, Dublin 2, Ireland; Janet S. Choi, MD MPH, Los Angeles, CA; James H. Kim, MD, Los Angeles, CA; Natalie Kim, MD, Los Angeles, CA; Elisabeth H. Ference, MD MPH, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the demographical and clinical factors that affect subjective smell and taste assessment and the importance of noting such factors in clinical practice.

Objectives: Examine the factors associated with under-and over-reporting of subjective changes in smell or taste compared to objective measures. **Study Design:** Cross-sectional analysis of 2013-2014 National Health and Nutrition Examination Survey (NHANES). **Methods:** We examined participants ≥ 40 years old who completed subjective smell (n=3,510) and taste (n=3,089) questionnaires, validated objective 8 odor pocket smell tests, and NaCl/quinine taste tests. Over and underestimation was determined based on the difference in subjective and objective results. Univariate and multivariate logistic regression analyses incorporated sampling weights. **Results:** A majority of participants correctly classified smell (73.7%, 95% CI 71.2-76.1%) and taste (78.3%, 95% CI 75.6-80.7%) impairments. Age >65 years (OR 2.23, p=0.001) and male gender (OR 0.54, p=0.003) were associated with underestimating, and sinus infections (OR 1.7, p=0.008) and persistent cold symptoms (OR 2.15, p=0.001) were associated with overestimating smell impairment. Various combinations of smoke, leather, onion and natural gas scents were incorrectly identified by individuals age >65 years, and correctly identified by those with sinus infections and persistent cold symptoms compared to counterpart groups. Age >65 years (OR 0.58, p=0.008) and persistent cold symptoms (OR 3.25, p=0.006) were associated with overestimating taste impairment. **Conclusions:** Although the concordance rate between subjective and objective assessment of smell and taste impairment remains high, we found that older age, history of sinus infection and persistent cold symptoms were associated with incorrect estimation of impairment. This suggests that the subjective assessment of smell and taste vary across demographical and clinical factors and is important to note such factors in clinical practice.

11. Sclerotherapy Treatment for Hereditary Hemorrhagic Telangiectasia Related Epistaxis: A Systematic Review

Brittney McCormick, BS, Scottsdale, AZ; Yassmeen Abdel-Aty, MD, Scottsdale, AZ; Lisa Marks, MLS, Scottsdale, AZ; Devyani Lal, MD, Scottsdale, AZ; Michael Marino, MD, Scottsdale, AZ

Educational Objective: At the conclusion of this presentation, the participants should be able to acknowledge the challenges of treating HHT related epistaxis and gain an understanding of the efficacy, safety and tolerability of sclerotherapy as a treatment for HHT related epistaxis.

Objectives: 1) Discuss the challenges of treating HHT related epistaxis and the wide range of interventions utilized; and 2) discuss the efficacy, safety, and tolerability of sclerotherapy as a novel treatment for HHT related epistaxis. **Study Design:** A systematic review was conducted regarding use of sclerotherapy as a treatment for HHT related epistaxis. **Methods:** Databases included were: Ovid Medline, Ovid EMBASE, Scopus and Web of Science. Articles were reviewed by two authors. Articles were evaluated and excluded according to PRISMA guidelines. **Results:** Seven articles met inclusion and exclusion criteria. The literature revealed improvement in HHT related epistaxis in patients who received sclerotherapy. The lack of uniform reporting measures prevented the ability to compare the studies quantitatively. Reported variables included number of injections, months of followup, changes in epistaxis severity score, previous treatments used to control epistaxis, and post-injection side effects. Forty-three percent of the studies utilized sodium tetradecyl sulfate (STS) as the sclerosing agent, one study used polidocanol, and another used Ethibloc. **Conclusions:** HHT related epistaxis can be difficult to treat. Sclerotherapy appears to be effective and safe for treating epistaxis secondary to HHT. Consistent reporting using validated instruments for epistaxis would be useful for more thoroughly evaluating outcomes.

12. Perceived Financial Insecurity Impacts Healthcare Decision Making among U.S. Patients with Sinusitis

Vivek Pandrangi, MD, Portland, OR; Jess C. Mace, MPH, Portland, OR; Nyssa Fox Farrell, MD, St. Louis, MO; Mathew Geltzeiler, MD, Portland, OR

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the impact of perceived financial insecurity among sinusitis patents on cost saving actions compared to common economic measures of financial status. Participants should also be able to describe how the severity of financial insecurity may impact different types of cost saving decisions and discuss the utility of screening for financial insecurity.

Objectives: The economic burden of sinusitis is significant, and socioeconomic factors can impact patient decision making. The purpose of this study was to examine the impact of perceived financial insecurity on healthcare decision making and treatment compliance among sinusitis patients. **Study Design:** Cross-sectional study using the 2018 National Health Interview Survey (NHIS). **Methods:** Demographics, clinical characteristics, responses to nine questions regarding financial stressors, and responses to nine questions regarding cost saving healthcare actions including seeking lower cost medication, medication noncompliance, and avoiding care visits due to costs were obtained. **Results:** There were 249 million U.S. patients identified, of which 28.9 million patients reported a diagnosis of sinusitis (11.6%). Sinusitis patients who reported cost saving actions had an increased severity of perceived financial insecurity than those without cost saving actions (p<0.001). On binary logistic regression, sinusitis patients with perceived financial insecurity had the highest odds of cost saving actions (odds ratio [OR]=6.14, 95% CI=6.112-6.170, p<0.001), followed by lack of health insurance (OR=4.41, 95% CI=4.388-4.430, p<0.001), long term unemployment (OR=1.74, 95% CI=1.730-1.749, p<0.001), and a ratio of income to the federal poverty level between 1-2 (OR=1.71, 95% CI=1.704-1.714, p<0.001). Reporting an increasing number of

financial stressors also increased the odds of cost saving actions (p<0.001). Differences were present between the number of financial stressors and types of cost saving actions reported. **Conclusions:** Perceived financial insecurity is associated with cost saving healthcare actions among sinusitis patients, including treatment noncompliance. Interventions to assess financial insecurity among sinusitis patients may facilitate shared decision making for optimal, individualized treatment plans that may lead to improved outcomes and quality of life.

13. Impact of Diabetes Mellitus on Postoperative Complications and Hospital Charges following Meningioma Surgery

Karandeep Singh Randhawa, BS, Newark, NJ; Chris B. Choi, BS, Newark, NJ; Aksha Parray, BA, Newark, NJ; Aakash Shah, BS, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the importance of diabetes and its association with adverse outcomes following meningioma surgery.

Objectives: To investigate the association between diabetes mellitus and rates of adverse outcomes in patients who underwent meningioma surgery. **Study Design:** Retrospective database review. **Methods:** The 2012-2014 National Inpatient Sample (NIS) database was used to identify patients with meningioma who underwent surgical resection. Chi square analysis and ANOVA were used to compare patient demographics, comorbidities, length of stay (LOS), hospital charges, and postoperative complications among the two cohorts. **Results:** 7745 patients were identified and divided into diabetic (n=1518) and non-diabetic (n=6627) cohorts. In the diabetic cohort, a higher proportion of patients were over the age of 65 years, Black or Hispanic, and insured by Medicare (P<0.001). Average LOS was longer in diabetic patients (8.15 vs 6.04 days, p<0.001), and total charges were higher ($123,250.71 vs 139,462.66, p < 0.001). Multivariate regression indicated diabetics had higher odds of a postoperative complication (OR 1.187, 95% CI 1.024-1.376, p=0.023) and mortality (OR 1.806, 95% CI 1.072-3.043, p=0.026). Specifically, diabetic patients experienced increased odds of pulmonary (OR 1.290, 95% CI 1.030-1.615, p=0.026), neurological (OR 1.484, 95% CI 1.197-1.840, p<0.001), and urinary/renal complications (OR 1.634, 95% CI 1.171-2.253, p=0.004) compared to non-diabetic patients. Additionally, diabetic patients were more likely to have a prolonged LOS (OR 1.420, 95% CI 1.163-1.734, p=0.001). **Conclusions:** Presence of diabetes in patients undergoing surgical resection of meningioma is associated with increased LOS and hospital charges. Surgeons should be aware of the increased postoperative complications and mortality associated with diabetes in patients undergoing meningioma surgery.

14. The Association between Obesity and Adverse Complications following Nasal Fracture Repairs

Karandeep Singh Randhawa, BS, Newark, NJ; Chris B. Choi, BS, Newark, NJ; Aakash Shah, BS, Newark, NJ; Aksha Parray, BA, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the importance of obesity and its impact on complications following nasal fracture repair.

Objectives: To investigate the association between obesity and rates of postoperative complications in nasal fracture repair patients. **Study Design:** Retrospective database review. **Methods:** The 2012-2014 National Inpatient Sample (NIS) database was used. Inclusion criteria included patients with ICD-9 codes indicating a primary diagnosis of nasal fracture and a nasal repair procedure, and these patients were divided into obese and non-obese cohorts. Pearson's chi squared analysis and logistic regression were used to determine the independent effect of covariates on postoperative complication rates. **Results:** 3292 individuals were identified and divided into obese (n=126) and non-obese (n=3166) cohorts. Chi squared analysis revealed congestive heart failure (p<0.001), chronic lung disease (p<0.001), depression (p=0.002), diabetes without chronic complications (p<0.001), diabetes with chronic complications (p=0.011), hypertension (p<0.001), hypothyroidism (p=0.001), metastatic cancer (p=0.027), pulmonary circulation disorders (p=0.004), and valvular disease (p<0.001) as significantly different comorbidities between the cohorts. Complication rates also significantly differed, with higher rates of urinary/renal, infection, operative, and all complications in the obese cohort. After adjusting for significant comorbidities, patient demographics, and hospital characteristics, multivariate regression analysis indicated obesity was independently associated with higher odds of a complication after nasal fracture repair (OR 1.550, 95% CI 1.007-2.385, p=0.039). Analysis of individual complication rates revealed obesity as an independent predictor of increase odds of operative complications (OR 1.596, 95% CI 1.024ΓÇô2.487, p=0.046). **Conclusions:** This analysis emphasizes obesity as a leading factor of postoperative complications after nasal fracture repair surgery, and these complications should be considered prior to surgery for nasal fracture repairs.

15. The Association Between Racial Disparities and Outcomes following Meningioma Surgery

Karandeep Singh Randhawa, BS, Newark, NJ; Chris B. Choi, BS, Newark, NJ; Aksha Parray, BA, Newark, NJ; Aakash Shah, BS, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the importance of race and its association with adverse outcomes following meningioma surgery.

Objectives: Racial disparity is important to consider in preoperative counseling. The goal of this study is to analyze the association between race and adverse outcomes in patients undergoing meningioma surgery. **Study Design:** Retrospective database review. **Methods:** The 2012-2014 National Inpatient Sample (NIS) database was used. Chi square analysis and ANOVA were used to compare demographics, comorbidities, complications, and hospital charges amongst race cohorts. Logistic regression was used to analyze the independent effect of race on outcomes. **Results:** 7274 patients who underwent surgical resection of meningioma were identified and divided into race cohorts: white, Black, Hispanic, Asian, Pacific Islander, and other. Chi square analysis revealed that gender, insurance status, and median income were significantly different among the cohorts. Multivariate regression showed that Black patients had increased risk for postoperative complications, including pulmonary (OR 1.588, 95% CI 1.201-3.021, p<0.001), urinary/renal (OR 1.799, 95% CI 1.217-2.657, p=0.003), infectious (OR 1.287, 95% CI 1.038-1.595, p=0.021) and operative complications (OR 1.287, 95% CI 1.038-1.595, p=0.021) compared to white patients. Asians and Pacific Islanders were more likely than white patients to have neurological (OR 1.595, 95% CI 1.000-2.545, p=0.050) and surgical complications (OR 1.578, 95% CI 1.136-2.192, p=0.006). Native Americans experienced higher odds of surgical complications (OR 2.896, 95% CI 1.370-6.124, p=0.005) than white patients. High hospital charges were more likely to be experienced by Blacks (OR 1.870, 95% CI 1.494-2.341, p<0.001) and Hispanics (OR 1.418, 95% CI 1.077-1.866, p=0.013). **Conclusions:** Race is an important factor associated with poorer outcomes of meningioma resection. Non-white patients undergoing meningioma surgery experience higher complication rates.

16. Evaluation of Long Term Postoperative Outcomes in Patients with Preoperative Purulent Nasal Drainage

Lindsey Ryan, MD, Augusta, GA; Chadi Makary, MD, Morgantown, WV; Adam Turry, BS, Augusta, GA; Camilo Reyes Gelves, MD, Augusta, GA; Stilianos Kountakis, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the effect of preoperative nasal purulence on long term postoperative surgical outcomes.

Objectives: We aim to determine the long term, post-surgical outcomes of patients with preoperative bilateral nasal purulence on nasal endoscopy compared to patients without the presence of nasal purulence prior to endoscopic sinus surgery. **Study Design:** This is a retrospective analysis conducted through an IRB approved database of patients from the institution's otolaryngology-head and neck surgery clinic. **Methods:** The data collected includes SNOT-22, Lund-MacKay (LM) CT scores and Lund-Kennedy (LK) scores. The study group contained patients with a preoperative bilateral thick purulent discharge (score of 2) on nasal endoscopy and the control group contained patients with watery clear discharge (score 1) or no discharge (score 0) on endoscopy. Longitudinal patient data was obtained from the preoperative visit, and at 1 week, 3-6 weeks, 2-4 months, 6-8 months, and 12-24 months postoperatively. **Results:** A total of 40 patients (19 purulent, 21 non-purulent) were sampled and their rhinological data was analyzed. There was no significant difference in SNOT-22 scores at any timepoint postoperatively. LM CT scores were higher in the purulent group vs. non-purulent (average 17.7 vs 12.3, respectively p= 0.022). LK endoscopy scores were significantly higher in the patients with purulent drainage as expected preoperatively (p= 0.0000002) and at all postoperative time points [1 week (p=0.002), 3-6 week (p=0.026), 2-4 month (p=0.0039), 6-8 months (p= 0.012), 12-24 months (p=0.0044)]. **Conclusions:** This data suggests that the presence of preoperative purulent nasal discharge results in objectively higher endoscopy scores at all postoperative time points, however, this does not correlate with higher postoperative symptom scores.

17. Evaluation of the Relationship between Epistaxis and Nasal Septal Deviation

Lindsey E. Ryan, MD, Augusta, GA; Chadi Makary, MD, Morgantown, WV; Conner Mount, BS, Augusta, GA; Adrian Williamson, MD, Morgantown, WV; Camilo Reyes Gelves, MD, Augusta, GA; Stilianos Kountakis, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the relationship between epistaxis and nasal septal deviation including the risk factors for epistaxis and associated comorbidities.

Objectives: The objective of this project is to determine the relationship between epistaxis and nasal septal deviation. We also aim to examine the role of comorbidities including hypertension, anticoagulation status, tobacco use history, and obesity. **Study Design:** This is a retrospective analysis was conducted through an IRB approved database of patients from the institution's otolaryngology-head and neck surgery clinic. **Methods:** The study group includes a sample of patients that presented to clinic with a diagnosis of epistaxis. The control group contains patients who presented with primary headache and without epistaxis. The data collected includes presence or absence of septal deviation, type of deviation, degree of deviation, BMI, smoking history, anticoagulation status, history of hypertension, and laboratory values to evaluate for thrombocytopenia. **Results:** A total of 110 patients with epistaxis and 50 control patients were sampled and their data analyzed. The groups were similar in age, gender, and BMI. There was no significant association between epistaxis and nasal septal deviation when compared to control group (p= 0.06). 34.5% of epistaxis patients had a tobacco use history versus 32% of controls (p= 0.73). There was a significant number of epistaxis patients on anticoagulation therapy at 38% versus 6% confirmed in the control group (p<0.00001). 42.7% of epistaxis patients carried a diagnosis of hypertension versus 16% of controls (p=0.0006). **Conclusions:** The data from this retrospective review does not show any significant association between nasal septal deviation and epistaxis. There is a significantly higher preponderance of comorbid conditions including hypertension and use of anticoagulant therapy in the epistaxis group.

18. Multiport Combined Endonasal and Transcervical Approach to Parapharyngeal Space Tumors

Dhruv Sharma, MD, Indianapolis, IN; Fahad Hasnain, BS, Indianapolis, IN; Cole P. Rodman, MD, Indianapolis, IN; Elisa A. Illing, MD, Indianapolis, IN; Avinash Mantravadi, MD, Indianapolis, IN; Jonathan Y. Ting, MD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the complicated anatomy of the parapharyngeal space; and 2) understand the utility of a multiport combined endonasal and transcervical approach in resecting parapharyngeal space tumors.

Objectives: The objective of this case series is to demonstrate the utility of a combined endonasal and transcervical approach in resecting parapharyngeal space (PPS) tumors. **Study Design:** Two surgical cases involving the resection of bulky tumors centered within the PPS are described with a particular focus on the surgical technique for the multiport combined approach utilizing endonasal and transcervical access sites. **Methods:** In both cases, initial approach to the parapharyngeal space and resection of the masses were conducted by dissecting through the pterygopalatine and infratemporal fossae after completing a standard maxillary antrostomy and sphenoethmoidectomy. Once the superior portion of the masses had been resected, a transcervical incision was performed to approach and free the tumors inferiorly. They were then superiorly displaced through the neck and the remainder of the resection was completed endonasally. A surgical video is available for presentation. **Results:** Resection was successful in both patients, and there is no evidence of recurrence on long term followup. One patient experienced no complications, and the second developed an ipsilateral middle ear effusion that resolved after in-office myringotomy. **Conclusions:** Bulky tumors involving the skull base and PPS can prove challenging to resect given the limited access that single site approaches afford. Ultimately, a combined approach can provide superior access to the parapharyngeal space. These cases demonstrate that a combined endonasal and transcervical approach can be efficacious in resecting large PPS tumors.

Facial Plastic and Reconstructive

19. Combined Surgical and Nonsurgical Approach Results in Greatest Improvement on Palpebral Fissure and Brow Height Symmetry in Facial Synkinesis Patients

Kurren Gill, MD, Philadelphia, PA; Emily Sagalow, BS, Philadelphia, PA; Raphael Banoub, MD, Philadelphia, PA; Howard Krein, MD, Philadelphia, PA; Joel Stanek, MD, Philadelphia, PA; Ryan Heffelfinger, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact of surgical and nonsurgical interventions on palpebral fissure and brow height symmetry in facial synkinesis patients.

Objectives: To determine the degree of improvement of palpebral fissure and brow height symmetry in patients with facial synkinesis after surgical and nonsurgical interventions. **Study Design:** Retrospective review. **Methods:** Patients with facial nerve synkinesis were identified at a single academic institution between January 2008 to June 2020. Patient portrait images were analyzed before and after interventions (preoperative Botox, selective neurolysis, postoperative Botox, or facial rehabilitation) using a custom graphical user interface, Emotrics Software (MEEI, Boston, MA). Main outcome measures were pre- and post-intervention palpebral fissure and brow height. **Results:** Of 126 patients with facial nerve impairment, 40 (32%) had synkinesis, and 112 (89%) had paralysis/paresis. Six patient eyebrow raise photos pre- and post-intervention were used for comparison and analysis. Surgical intervention consisted of selective neurolysis (4). Nonsurgical interventions included Botox (preoperative: 4, postoperative: 1) and facial rehabilitation (1). Mean followup was 4.3 months (range 0.5-

21.3). Overall left-right eye symmetry (palpebral fissure and brow height) improved with combination surgical Botox (p=0.009) and surgical intervention alone (p=0.039). Greater improvement in overall left-right eye symmetry was found with surgical-nonsurgical combinations than surgical and nonsurgical interventions alone (p=0.054). **Conclusions:** We recommend a comprehensive approach to management of facial paralysis and synkinesis consisting of both surgical and nonsurgical interventions as this combined approach resulted in the most significant degree of improvement in palpebral fissure and brow height symmetry over time.

20. Intraoperative Evaluation of Nasal Valve Repair Interventions: A Prospective Analysis

Kurren Gill, MD, Philadelphia, PA; S. Hamad Sagheer, BS, Philadelphia, PA; Cory Bovenzi, MD, Philadelphia, PA; Brian Yan, BS, Philadelphia, PA; Howard Krein, MD PhD, Philadelphia, PA; Ryan Heffelfinger, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the promise of suction assisted evaluation of nasal valve collapse after surgical intervention.

Objectives: To allow for early identification and treatment of inadequate nasal valve repair interventions in the intraoperative setting, based on degree of nasal valve collapse quantified by suction assisted pressure readings. Patient outcomes were measured by comparison of pre and postoperative Nasal Obstruction Symptom Evaluation (NOSE) surveys. **Study Design:** Prospective study. **Methods:** All enrolled patients undergo suction assisted evaluation of nasal valve collapse before surgical intervention. Patients randomized into the experimental group underwent repeat assessment after various nasal valve interventions, compared to a control group where adequacy of interventions was assessed by palpation of the nasal ala. **Results:** Six patients who underwent nasal valve repair were randomized into control (3) or experimental (3) groups. Nasal valve interventions included alar rim grafts (3), spreader grafts (3), batten grafts (1), and nasal valve suture suspension (1). NOSE scores decreased by an average factor of 3.1 (p>0.05). No patients in the experimental group required additional nasal valve interventions after repeat suction assisted evaluations. After nasal valve interventions, average suction reading at first sign of collapse increased by 89% and average suction reading at maximal collapse increased by 37.9% (p>0.05 respectively). **Conclusions:** Suction assisted evaluation of nasal valve collapse after various surgical interventions can be a valuable intraoperative instrument for determining whether additional interventions are necessary to improve nasal valve integrity.

21. Rate of Fat Graft Volume Loss after Parotidectomy

Kurren Gill, MD, Philadelphia, PA; Emily Sagalow, BS, Philadelphia, PA; Raphael Banoub, MD, Philadelphia, PA; Vivian Xu, BS, Philadelphia, PA; Joel Stanek, MD, Philadelphia, PA; Ryan Heffelfinger, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the rate of fat graft volume loss after parotidectomy and related predicting factors.

Objectives: To determine the rate of volume loss of umbilical or dermal fat grafts used for reconstruction of parotidectomy defects and to identify any risk factors to predict anticipated volume atrophy over time. **Study Design:** Retrospective chart review. **Methods:** Patients who underwent parotidectomy between July 2012 to June 2020 at a single academic institution were included. Patients reconstructed with umbilical fat or dermal fat grafts with postoperative MRIs at various time intervals were analyzed. Fat graft volume on MRI was calculated using an ellipsoid approximation. Percent volume loss was calculated as compared to the initial defect volume, which was approximated using pathology reports of resected parotid specimen dimensions. **Results:** Of 360 parotidectomy patients, 124 (34.4%) were reconstructed with umbilical or dermal fat grafts. Thirteen patients received postoperative MRIs for disease surveillance. These patients were used for analysis. The association between radiation therapy and smoking with rate of fat graft volume loss was insignificant (p=0.33, p=0.42). Alcohol consumption was associated with volume loss (p=0.01). Mean percent volume loss was 60.3% (range 20.8%-95.6%) over an average time of 7.4 months postop (range 2.5-25.8 months). Mean rate of volume loss was calculated as 9.6% volume loss/month. **Conclusions:** Although there was not a significant association between radiation therapy and smoking with rate of fat graft volume loss, we recognize the limitations of our sample size. We recommend accounting for a loss of approximately 60% of fat grafts by approximately 7.5 months when reconstructing parotidectomy defects.

22. Trends in Medicare Reimbursement of Flap Procedures from 2000 to 2020

Dongmin C. Kim, Newark, NJ; Gregory L. Barinsky, PharmD, Newark, NJ; Ghayoour S. Mir, DO, Newark, NJ; Soly Baredes, MD, Newark, NJ; Richard C. Park, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants will be able to recognize the trends in Medicare reimbursement for flap procedures from 2000 to 2020.

Objectives: Medicare reimbursement rates have been shown to be decreasing across many specialties, including otolaryngology. The aim of this study is to investigate trends in Medicare reimbursement specifically for flap procedures. **Study Design:** Review of public reimbursement data. **Methods:** The Physician Fee Schedule lookup tool from the Centers for Medicare and Medicaid Services was queried for flap procedures using current procedural terminology (CPT) codes from 2000-2020. Trends in reimbursement were analyzed for total and annual percent change, correlation coefficient (R2), and compound annual growth rate. The consumer price index (CPI) was used to adjust for inflation to 2020 US dollars. **Results:** From 2000 to 2020, inflation adjusted procedural reimbursement for all flap procedures decreased 37.6%. The greatest difference occurred between the year 2006 and 2007 with an average decrease of 10.8% for all codes. The CPT code 20969 (free osteocutaneous flap with microvascular anastomosis) had the largest decrease in adjusted reimbursement (38.9%), while the code 14040 (adjacent tissue transfer or rearrangement) experienced the smallest decrease (9.8%). The average correlation coefficient for all procedures was of substantial correlation (R2=0.865). From 2000 to 2020 flap procedures experienced an average percent decrease of -2.28% per year with a compound annual growth rate of -2.33%. Notably, the decrease in adjusted reimbursement for free flaps (33.61%) was greater than that for adjacent/local flaps (19.33%). **Conclusions:** There was an overall yearly decline in Medicare reimbursement rates for flap procedures from 2000 to 2020. It is important that otolaryngologists and other stakeholders be cognizant of these trends as healthcare resource optimization is prioritized.

23. Patient Reported Outcomes Regarding Facial Disfigurement: Indications for Facial Allotransplantation

Damon Deni Monroe, MD, Edmonton, AB Canada; Hadi Seikaly, MD FRCSC, Edmonton, AB Canada; David W.J. Cote, MD MPH, Edmonton, AB Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to explain 1) the importance of PROs in the context of severe facial disfigurement.; 2) the most prominent patient reported quality of life domains affected by severe facial disfigurement; and 3) the role of a validated questionnaire to assess patient reported outcomes following severe facial disfigurement.

Objectives: To develop a patient reported outcomes (PRO) assessment tool specific for patients with major disfigurement affecting the aesthetic triangle of the face. **Study Design:** This is a three phase study employing grounded theory methodology. The first phase includes 15 individual phone interviews with eligible patients to identify the patient reported determinants of quality of life pertaining to their facial disfigurements. These are coded and sorted to build a preliminary conceptual framework. Phase two comprised of a focus group of 5 patients presented with the conceptual framework created in phase one and asked to rank the treatment outcomes most important to them and their quality of life. Following this, the list of prioritized outcome domains was taken to a second focus group comprised of 5 surgical experts who were tasked with creating a questionnaire based on the patient ranked outcome domains, to assess PROs following facial disfigurement. Finally, phase three saw the administration of the questionnaire to 10 new patients via individually conducted interviews for content validity. **Methods:** Setting: tertiary otolaryngology - head and neck surgery referral center. Patients: patients were recruited via the participating otolaryngologists' existing patient records. The criteria for significant facial disfigurement was a defect that occupies at least 1/3 of the patient's face. All defect etiologies (trauma, oncologic, surgical, congenital) were accepted. Main outcome measures: primary outcomes include domains of patient reported determinants of quality of life regarding their disfigurements (e.g., function such as speech, eating, facial animation; aesthetics, scars, concealment; self-image, employment; available treatment options). The subsequent questionnaire to assess PROs following facial disfigurement will be assessed for validity by a novel group of patients. **Results:** A novel PRO assessment tool was generated to evaluate which domains of quality of life are most pertinent to patients with severe facial disfigurement. **Conclusions:** A validated PRO offers the provider an objective and systematic approach to treatment.

24. Impact of Great Auricular Nerve Sacrifice on Sensory Disturbance after Parotidectomy

Emily Sagalow, BS, Philadelphia, PA; Kurren Gill, MD, Philadelphia, PA; Rohan Ganti, MS MPH, Philadelphia, PA; Kabir Malkani, BS, Philadelphia, PA; Joel Stanek, MD, Philadelphia, PA; Ryan Heffelfinger, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the relationship between great auricular nerve (GAN) sacrifice during parotidectomy on postoperative sensory disturbance.

Objectives: To determine the impact of great auricular nerve (GAN) sacrifice during parotidectomy on postoperative sensory disturbance. **Study Design:** Retrospective chart review. **Methods:** Patients who underwent parotidectomy between July 2012 to June 2020 at a single academic institution were included. Operative notes were reviewed to determine incidence of GAN sacrifice. Prevalence of patient reported sensory complaints in the GAN distribution and time to spontaneous resolution of symptoms was assessed. **Results:** Of 360 parotidectomy patients, 113 (31%) endorsed complaints of postoperative sensory disturbances in the GAN distribution typically characterized by numbness or shooting pains. At almost 3 months postop, 77 patients (68%) continued to complain of symptoms. Six (7.8%) experienced

spontaneous resolution of symptoms at most recent followup. GAN sacrifice was present in 8 (7.1%) of 113 patients who experienced sensory disturbances compared to 7 (3%) who reported no sensory disturbances (p=0.06, OR=2.6, CI: 0.91-6.88). Of those that experienced a sensory disturbance, GAN sacrifice was not significantly associated with likelihood of spontaneous recovery (p=0.86, OR=1.22, 95%CI: 0.10-8.5). **Conclusions:** We report the largest series to date of parotidectomy patients used to determine incidence of postoperative sensory disturbance as it relates to intraoperative GAN sacrifice. There was a trend towards significance with association of GAN sacrifice on postoperative sensory complaints (p=0.06). When possible, we advocate for GAN preservation to reduce incidence of postoperative sensory disturbances.

25. Fat Graft for Parotidectomy Defect Reconstruction in the Setting of Malignant Disease

S. Hamad Sagheer, BS, Philadelphia, PA; Alex Knops, BS, Philadelphia, PA; Kurren Gill, MD, Philadelphia, PA; Vivian Xu, BS, Philadelphia, PA; Howard Krein, MD PhD, Philadelphia, PA; Ryan Heffelfinger, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the safety of fat graft transfers in parotidectomy defects for malignant neoplasms.

Objectives: Currently limited data examines the safety of utilizing fat transfers in the setting of malignant parotid disease. Here we evaluate the safety of fat graft reconstruction of parotidectomy defects in the setting of malignant disease. **Study Design:** Retrospective cohort study. **Methods:** Electronic chart review of patients who underwent parotidectomy from 2012-2020 were reviewed. **Results:** Three hundred and sixty-one patients were identified at a single institution who underwent parotidectomy, and 113 were for malignancy. One hundred and thirty-two patients underwent fat graft reconstruction (49.2%, n=65 for umbilical, 50.8%, n=67 for dermal). A minority of patients had malignant pathology (34.8%, n=46). The most common malignant tumors were squamous cell carcinoma (n=15), acinic cell carcinoma (n=9), and mucoepidermoid carcinoma (n=6). Postoperative radiation was used in 20 patients (45.5%). Complications include surgical site necrosis (13%), hematoma (4.3%), and infection (2.2%). Overall incidence of malignant recurrence was 4.4% with a mean time of followup of 10.3 (range 0 - 77.3) months. Incidence of malignant recurrence in the fat graft reconstruction subset was 0% with a mean time of followup of 9.76 (range 0.2 - 49.3) months. There was no association between use of fat graft on the rate of recurrence (p>0.05). **Conclusions:** Parotidectomy defects for malignant neoplasms can be safely and effectively reconstructed with fat graft transfers, with no negative impact on surveillance for disease recurrence.

26. Surgical Specialty as a Predictor of Complications following Facial Fracture Repair: A Propensity Matched Analysis

Parisorn Thepmankorn, BS, Newark, NJ; Chris B. Choi, BS, Newark, NJ; Aakash Shah, BS, Newark, NJ; Aksha Parray, BA, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the importance of different surgical specialties and their association with rates of complications following facial fracture repair.

Objectives: To investigate the association between surgical specialties and rates of postoperative complications in patients undergoing facial fracture repair. **Study Design:** Retrospective database review. **Methods:** The 2005-2015 American College of Surgeons National Surgical Quality Improvement Program databases were reviewed. Patients who underwent facial fracture repair with either an otolaryngologist or plastic surgeon were identified. Propensity score matching (PSM) was conducted to homogenize the study population. Chi square analysis, independent samples t-test analysis, and multivariate logistic regression were used to assess the independent effect of covariates on postoperative complication rates. **Results:** 3,480 patients who met inclusion criteria were identified. A cohort of 2,502 patients was matched using PSM. PSM corrected for all significantly distributed comorbidities except for diabetes mellitus, bleeding disorder, hemiplegia, wound class, and emergency case. Univariate analysis found that otolaryngology cases had a higher rate of surgical complications (p=0.035) and postoperative complications (p=0.023) compared to plastic surgery cases. Otolaryngology cases had a significantly longer operative time (p=0.016). However, multivariate regression analysis found that otolaryngology facial fracture surgical complication rates and overall complications rates (OR 1.534, 95% CI 0.289-8.135, p=0.615) were not significantly higher than those of plastic surgery (OR 1.540, 95% CI 0.278-8.528, p=0.621). **Conclusions:** This study reveals that surgical specialty is not associated with increased rates of postoperative complications following facial fracture repair. This suggests that the current breadth of plastic surgery and otolaryngology training in treating facial fractures should be maintained to optimize patient outcomes.

General

27. Risk Factors for Admission after Ambulatory Adult Tonsillectomy

Gregory L. Barinsky, PharmD, Newark, NJ; David W. Wassef, BS, Newark, NJ; Roman Povolotskiy, MD, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Wayne D. Hsueh, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss factors that may increase a patient's risk of admission after adult outpatient tonsillectomy.

Objectives: To elucidate risk factors for inpatient admission in adults undergoing outpatient tonsillectomy. **Study Design:** Retrospective analysis of a surgical database. **Methods:** The 2010-2018 National Surgical Quality Improvement Program was queried for all adult patients who underwent tonsillectomy using CPT code 42826. Cases with other concurrent procedures were excluded. Cases that were not outpatient, elective, and nonemergent were excluded. Unanticipated admissions were defined as a total hospital stay of greater than 0 days. Univariate analysis and multivariate regression modelling were utilized to detect independent predictors of admission. **Results:** 23,157 cases of adult tonsillectomies were analyzed, of which 993 (4.3%) were admitted. Admitted patients were significantly older (mean age 34.1 vs 29.0 years, $p<0.001$) and more likely to be male (37.9% vs 30.5%, $p<0.001$). The admitted cohort was more likely to have hypertension, diabetes, obesity, dyspnea, chronic steroid use, bleeding disorders, and chronic obstructive pulmonary disease (all $p<0.001$). There was no difference in smoking status (16.0% vs 15.7%, $p=0.810$). Multivariate regression showed age (OR 1.015, $p<0.001$), male gender (OR 1.378, $p<0.001$), hypertension (OR 1.504, $p<0.001$), obesity (1.692, $p<0.001$), chronic steroid use (OR 1.715, $p=0.017$), bleeding disorders (OR 7.781, $p<0.001$), and ASA classification III-IV (OR 2.183, $p<0.001$) to be independent predictors of admission. **Conclusions:** Older age and male gender were independently associated with admission after outpatient adult tonsillectomy. Comorbidities associated with admission were hypertension, obesity, steroid use, bleeding disorders, and ASA classification III-IV. Recognizing and optimizing patients at risk of admission after routine outpatient procedures may help lower healthcare resource utilization.

28. Meta-Analysis of Substances Used for Injection Augmentation Pharyngoplasty for Treatment of Velopharyngeal Insufficiency

Rebecca Kruger Bell, Boston, MA; Alexander P. Marston, MD, Boston, MA; Ketch W. Cowan, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should better understand the different substances available for use in injection augmentation pharyngoplasty and their benefits and risks.

Objectives: Velopharyngeal insufficiency (VPI) can cause hypernasal speech, nasal air emissions, and nasal regurgitation of fluids. While reconstructive palatoplasty and pharyngoplasty techniques are the mainstay of treatment for severe VPI, posterior pharyngeal injection augmentation pharyngoplasty offers a minimally invasive approach in select patients with mild VPI. Both autologous and synthetic materials are described as injectable materials, however, no previous study has compared outcomes across materials. **Study Design:** We conducted a meta-analysis of the literature including studies that addressed VPI managed with pharyngeal injection augmentation. **Methods:** Studies were systematically selected from PubMed. Patient demographics, etiology of VPI, injection material, volume of injection, number of injections, complications and both subjective and objective outcomes were recorded, and results were compared using SPSS statistical software. **Results:** Thirty-one studies met our inclusion criteria which encompassed 668 patients who underwent injection pharyngoplasty. Injection materials included Teflon (n=81), gax collagen (n=5), calcium hydroxyapatite (n=36), dextranomer and hyaluronic qcid (n=72) and autologous fat (n=471). Functional improvements in nasality were recorded in the majority of patients (0.79, 95% CI 0.80 to 0.90). However, a greater proportion of patients in the synthetic materials group demonstrated either reduced or resolved hypernasality ($x2=5.579$, $p=0.018$) and objective closure of velopharyngeal gap ($p<0.001$). **Conclusions:** Despite the heterogeneity of patients and variations in outcome measures among studies included in this meta-analysis, the results identified that nearly 80% of all patients had postoperative reduced or resolved hypernasality. Interestingly, there was improved hypernasality and velopharyngeal gap closure following the use of synthetic materials as opposed to autologous fat.

29. High Intensity Focused Ultrasound (HIFU) for Benign Solid Thyroid Nodules: Systematic Review and Meta-Analysis

Ezer Haim Benaim, BA, Memphis, TN; Michael J. Herr, PhD, Memphis, TN; Madhu Mamidala, PhD, Memphis, TN; M. Boyd Gillespie, MD MSc, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the indication, mechanism, effectiveness, and limitations of HIFU for benign solid thyroid nodules.

Objectives: High intensity focused ultrasound (HIFU) is a noninvasive treatment option for larger, benign thyroid nodules causing compressive symptoms or cosmetic concerns. The objective of this study is to determine the effectiveness of HIFU in the treatment of benign thyroid nodules. **Study Design:** Literature search of PubMed, Scopus, Cochrane, and Ovid by two independent authors was used to evaluate studies reporting HIFU for single use treatment of benign, predominantly solid, thyroid nodules. **Methods:** Study characteristics, patient demographics, nodule pre- and post-ablative size, and adverse effects outcomes were extracted. Primary outcomes were the volume reduction rate (VRR) and the success rate (percentage of patients with >50% VRR). **Results:** Seven of 29 articles reviewed met inclusion criteria -- two prospective and five retrospective. Most exclusions were based on overlapping patient populations or incomplete data. In total, 235 nodules in 232 patients and 203 nodules in 203 patients were assessed at 1 and 2 year followup, respectively. Nodules assessed were in overwhelmingly female populations (0 to 22.6% male). Average baseline nodule volume ranged from 3.1 to 21.7 mL. Mean VRR (%) at one, three, six, twelve, and twenty-four months was 24.28, 46.12, 59.94, 64.71, and 62.23, respectively. The success rate at 6 months ranged from 6.4% to 81.8%. Pain was the most common adverse effect. Edema, unilateral vocal cord paresis, Horner's syndrome, and hoarseness were also reported. **Conclusions:** HIFU has a broad range of effectiveness as a noninvasive alternative treatment. Further studies must be performed to optimize not only the therapy but also patient selection criteria to achieve higher success rates.

30. Use of Nebulized Tranexamic Acid in Adult and Pediatric Post-Tonsillectomy Hemorrhage

Angela Cao, MD, Bronx, NY; Joshua Silverman, MD PhD, New Hyde Park, NY; Gerald Zahtz, MD, New Hyde Park, NY; Lee Smith, MD, New Hyde Park, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand scenarios where nebulized tranexamic acid may be utilized to help manage post-tonsillectomy hemorrhage in the acute setting.

Objectives: Post-tonsillectomy hemorrhage is a serious complication and is one of the most common reasons for emergency department visits following tonsillectomy. A percentage of these patients require a return trip to the operating room for hemostasis. A variety of methods exist for control of post-tonsillectomy hemorrhage. We report the use of nebulized tranexamic acid (TXA) in two adult and two pediatric patients who presented with post-tonsillectomy hemorrhage. **Study Design:** Retrospective chart review. **Methods:** A retrospective chart review was conducted on four patients at two tertiary care hospital centers. Patients were identified if they experienced post-tonsillectomy hemorrhage and were administered nebulized TXA during their hospital course for bleeding control. **Results:** Two pediatric (8 and 15 years old) and two adult (27 and 31 years old) patients who presented to the emergency department (ED) with post-tonsillectomy hemorrhage were treated with 5 ml of nebulized TXA (100 mg/ml). All patients had previously undergone extracapsular tonsillectomy. One patient required additional bedside cautery with silver nitrate after nebulized TXA, but no patients required a return trip to the operating room. No patients experienced adverse medication side effects. **Conclusions:** In this study we report on the use of nebulized TXA in a series of patients with post-tonsillectomy hemorrhage. All patients presented with significant post-tonsillectomy hemorrhage and were successfully managed without a return trip to the operating room. One patient required bedside silver nitrate cautery in addition to nebulized TXA. Additional studies need to be performed to confirm safety and efficacy of this potential new modality.

31. Otomatch, AAMC and NRMP: How Do They Match Up? Comparison of Applicant Data for Individuals Applying to Otolaryngology Residency

Anthony Y. Cheung, BA, Boston, MA; Kristina Powers, BS, Buffalo, NY; Wesley H. Stepp, MD PhD, Chapel Hill, NC; Justin S. Golub, MD MS, New York, NY; Jessica R. Levi, MD, Boston, MA; Samuel A. Reyes, MD PhD, Buffalo, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to compare self-reported match data from the online forum Otomatch.com with official metrics from the National Residency Match Program and the Association of American Medical Colleges.

Objectives: Otomatch.com is an online forum for residency applicants to discuss the otolaryngology match process including academic metrics. The purpose of this study is to assess the accuracy of self-reported match data on Otomatch relative to official data reported by the National Residency Match Program (NRMP) and the Association of American Medical Colleges (AAMC). **Study Design:** Cross-sectional study. **Methods:** Data was collected from publicly editable Otomatch forums (2017-2018, 2018-2019, 2019-2020) and curated Otomatch survey responses (2018-2019, 2019-2020) whose results are released after Match Day. Aggregated data was collected from the NRMP 2018 Charting Outcomes in the Match and AAMC Report on Residents (2017-2018, 2018-2019). Measures of interest included step 1 scores, step 2 CK scores, publications, number of interview invitations, number of interviews attended, and AOA status. ANOVA and two tailed T tests were performed to compare variables within each match year. **Results:** Average step 2 CK score was significantly higher on publicly editable Otomatch forums than AAMC in 2017-2018 (257 vs. 253, $p<0.05$) and 2018-2019 (258 vs. 252, $p<0.05$). Interviews attended were significantly higher on Otomatch survey responses than the publicly editable forum in 2019-2020

(13 vs. 9, p-value<0.05). Step 1 scores, publications, interview invitations, and AOA status were not statistically significantly different when data was available. **Conclusions:** Applicant statistics from online forums, online surveys, NRMP, and AAMC are consistent, with the exception of step 2 CK scores. Self-reported data on the Otomatch forum is an accurate estimate of academic metrics of otolaryngology residency applicants.

32. Geographic Trends in the Otolaryngology Residency Match

Yeyoon Choi, MS BA, Boston, MA; Jacob Bloom, MD, Boston, MA; Jessica Levi, MD, Boston, MA; Michael Cohen, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to consider the importance of geographic locations of pre-residency affiliations in the otolaryngology residency match.

Objectives: To analyze geographic trends in the otolaryngology residency match. **Study Design:** Cross-sectional study of 116 otolaryngology residency programs, including 1657 residents. **Methods:** Medical school, undergraduate institution, and hometown of otolaryngology residents in the academic year 2019-2020 were recorded from programs' websites, then coded numerically according to general and specific US census divisions. Chi squared and general linear regression models were used for statistical analysis, performed on the R analysis software. **Results:** Of 1402 residents, 784 (55.9%) and 556 (39.6%) matched in the same region as their medical school for general and specific divisions, respectively. Of 1000 residents, 475 (47.5%) and 316 (31.6%) matched in the same region as their undergraduate institutions for general and specific divisions, respectively. Of 681 residents, 321 (47.1%) and 240 (35.2%) matched in the same region as their hometown for general and specific divisions, respectively. Residency programs in the South, Northeast, and Midwest take significantly more residents who went to medical school in the same region ($P < 0.02$). Programs in the South appear to most strongly prefer medical students from that region (63%, $P < 0.0001$). 17.9% (252 of 1402) of residents matched at their same medical institution or an affiliated program. 34.8% (208 of 597) and 44.8% (268 of 597) of residents matched at a region with no previous affiliation for general and specific divisions, respectively. **Conclusions:** There are geographic associations between residents' pre-residency locations and their residency programs and are strongest for programs in the South. It is important for both otolaryngology residency programs and applicants to consider this information.

33. Sialendoscopy and Sjogren's Disease: A Systematic Review

Kimberly Keen Coca, BS, Memphis, TN; M. Boyd Gillespie, MD MSc, Memphis, TN; Nicholas A. Beckmann, DO, Memphis, TN; Rongshun Zhu, PhD, Memphis, TN; Robert L. Witt, MD, Newark, DE

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the level of benefit expected for a Sjogren's syndrome (SS) patient undergoing therapeutic sialendoscopy.

Objectives: This study is a systematic review of the literature which seeks to estimate the level of benefit expected for a Sjogren's syndrome (SS) patient undergoing therapeutic sialendoscopy. **Study Design:** Systematic review of the literature. **Methods:** A systematic review was undertaken of the available English literature as of November 2019 regarding treatment of SS with sialendoscopy. A total of 122 relevant articles were found; 18 met criteria for review; and 6 articles were included. **Results:** In this review, we discuss the data on the use of sialendoscopy in the treatment of SS. Despite the sparsity of literature on this topic, it was found that sialendoscopy resulted in partial or complete resolution of symptoms in 92% (115/125) of patients. **Conclusions:** This review provides support for the usage of sialendoscopy in the treatment of SS salivary disease. Larger studies and studies with control groups are needed to validate these results and provide a more consistent therapy protocol.

34. Validation of the Oral Health Impact Profile (OHIP) Survey in Salivary Disease

Kimberly Keen Coca, BS, Memphis, TN; Leighton Reed, MD, Memphis, TN; Madhu Mamidala, PhD, Memphis, TN; M. Boyd Gillespie, MD MSc, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to determine usefulness of OHIP survey in patients with salivary disease.

Objectives: The Oral Health Impact Profile (OHIP) is a previously validated, brief, patient friendly questionnaire used to determine the impact of oral disease on patient quality of life. The present study seeks to validate the use of the modified salivary OHIP survey in patients with chronic salivary disease. **Study Design:** Prospective trial of patients with chronic salivary disease treated using gland preserving surgery between 2017 and 2020 at a tertiary academic medical center. A group of patients without salivary disease undergoing septoplasty was used as a control group. **Methods:** A total of 54 patients with chronic salivary disease and a control group of 9 patients undergoing septoplasty were surveyed using the modified salivary OHIP before surgery and six weeks following operation. Additional factors analyzed included age, gender, etiology of salivary disease, general quality of life using the EQ-5D-5L, and general salivary symptoms. **Results:** There is a statistically significant difference between the groups regarding change in modified OHIP scores before and after surgery

(p=0.03). Salivary patients had a statistically significant decrease in modified OHIP score indicating improved salivary quality of life (p-value <0.00001), with an average change in score of -10. The control group did not have a significant change in modified OHIP score (p=0.29). There was no significant difference between the groups in regard to change in EQ-5D score, age, or gender. **Conclusions:** The modified salivary OHIP allows for a specific, targeted survey of salivary symptoms and is a useful tool in quantifying symptomatic changes in patients with chronic salivary disease.

35. Improving Consultant Efficiency through an Otolaryngology Consult Order Set

Julia Comer, MD, Gainesville, FL; Nate Breslin, BA, Gainesville, FL (Presenter); Varun Varadarajan, MD, Columbus, OH; Neil Chheda, MD, Gainesville, FL; William Collins, MD, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to educate the audience on the otolaryngology consult process and potential interventions to increase both consult efficiency and the efficiency of the emergency department as a whole.

Objectives: The objective of this study was to assess the efficiency of the otolaryngology consultation service after the implementation of consult order sets utilizing the electronic health record (EHR) system. The order sets automatically populate necessary procedural supplies in patients' EHRs prior to arrival of the consulting service; thus, helping mitigate delays in consult completion. **Study Design:** Retrospective and prospective cohort study. **Methods:** 500 patients were reviewed who were evaluated by the otolaryngology consult service. 250 consults were placed prior to initiation of the order set, and the remaining 250 were completed with the order set in place. Emphasis was placed on reviewing consults from the emergency department (ED) that included specific diagnoses and procedures included in the order sets. Diagnoses, age, and demographics were similar among both groups of patients. Primary endpoints included total consult time, time from consult completion to discharge and time to physician arrival at bedside. Total consult time was measured starting from the time the consult order was placed to the time the consult note was completed in the EHR. **Results:** There was a significant difference in total consult time and time to discharge (p<.01). Mean total consult time was 145 minutes preorder set and 100 minutes postorder set. Mean time to discharge was 187 minutes preorder set and 114 minutes postorder set. **Conclusions:** Our results indicate that the use of an order set can help increase consult efficiency, reflected by significant decreases in total consult time and time to discharge. Consulting services should consider implementing similar order sets in their department. Not only can they increase efficiency of the consulting service, but may also increase the efficiency of the emergency department itself.

36. Benign Myofibroblastic Proliferation of the Orbit: A Rare Case Report

Katherine R. Farris, BS, El Paso, TX; Patricia McAdams, MD, El Paso, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to better identify and address a patient presenting with possible benign myofibroblastic proliferation (BMP).

Objectives: This study intends to assist colleagues in identification, management, and treatment of cases of benign myofibroblastic proliferation (BMP) through discussion of a rare case example of orbital BMP. Additionally this study serves to add to the literature on a rare diagnosis. **Study Design:** This study describes a case report of a patient presenting with a rare tumor identified as benign myofibroblastic proliferation. This design type was chosen to assist in bringing an understanding of a rare tumor through discussion of its unusual characteristics. **Methods:** The patient in this case report was selected for write up due to his unique and challenging presentation and workup. A search of the literature found only 28 cases of orbital BMP published since 1995. **Results:** Histopathological examination is necessary for accurate diagnosis of BMP. Samples demonstrate a variable mixture of myofibroblasts, inflammatory cells, and plasma cells. The samples commonly follow a myxoid pattern resembling granular tissue and a spindle cell resembling a fibrous scar. The tissue sample from the patient in this case study is consistent with these features. **Conclusions:** This case study of BMP of the orbit is a rare presentation, which we want to report to help with diagnosis and treatment of similar cases. Diagnosis can be difficult and radiological examination often has limited value. Histopathological examination is most diagnostic of BMP and surgical excision is the gold standard of treatment.

37. The Efficacy of Prophylactic Migraine Medications in Patients with Recurrent Benign Paroxysmal Positional Vertigo

Shahrnaz Jamshidi, MD, Irvine, CA; Khodayar Goshtasbi, MS, Irvine, CA; Mehdi Abouzari, MD PhD, Irvine, CA; Sina Soltanzadeh-Zarandi, BS, Irvine, CA; Ariel Lee, BS, Irvine, CA; Hamid R. Djalilian, MD, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the potential use of migraine prophylactic medication in treating patients with recurrent benign paroxysmal positional vertigo.

Objectives: To evaluate the efficacy of prophylactic migraine medications in symptomatic treatment of recurrent benign paroxysmal positional vertigo (BPPV). **Study Design:** Retrospective case series. **Methods:** Patients presenting between 2017-2019 with recurrent BPPV (≥ 3 episodes in 6 months prior to presentation with resolution after canalith repositioning maneuver) were treated with the migraine regimen. This included lifestyle and dietary changes as well as supplements (magnesium and riboflavin) and prophylactic medication (nortriptyline, topiramate, and/or verapamil) with dose escalation if needed. **Results:** A total of 31 patients (52% female, mean age 57 ± 13 years) with recurrent BPPV who were treated by migraine medications with a minimum of 6 month followup were included. Twenty-five (81%) patients did not experience further episodes of recurrent BPPV during the followup period (median 12 months, range 6-25 months). Also, 54% of patients reported improvement in their quality of sleep. No patient had adverse effects to the prescribed medications. The remaining 19% of patient had a reduction in the frequency of attacks or intensity of symptoms. None of the patients in the cohort needed surgical therapy. **Conclusions:** In a limited retrospective cohort, 81% of the recurrent BPPV patients responded to prophylactic migraine treatment with symptomatic improvements. Prior to surgical therapy, consideration should be given to treating patients with recurrent BPPV with migraine prophylaxis therapy.

38. Necrotizing Soft Tissue Infection Involving the Trachea after Percutaneous Tracheostomy: A Case Report and Literature Review

Cynthia Kay Koenigsberg, BS, Minneapolis, MN; Margaret Engelhardt, MD, Minneapolis, MN; William Debusk, MD, Minneapolis, MN; Whitney Chiao, MD, Minneapolis, MN; William Walsh, MD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the presentation of a percutaneous tracheostomy related necrotizing soft tissue infection.

Objectives: To describe a unique case of necrotizing soft tissue infection of the neck with tracheal involvement in a patient following percutaneous tracheostomy and to examine the related literature. **Study Design:** Case report and literature review. **Methods:** The patient's chart was reviewed for demographics, comorbidities, presentation, diagnosis, and treatment with review of the literature for similar cases. **Results:** A 57 year old man with an unknown past medical history and elevated hemoglobin A1C on admission presented with altered mental status after suspected head trauma. He was intubated on arrival for severe agitation and underwent hemicraniectomy and external ventricular drain placement for a subdural hematoma. Twelve days into his hospitalization, a percutaneous tracheostomy was performed. The patient was subsequently treated for pneumonia, and eight days after tracheostomy, erythema and purulence were noted around the site. CT imaging demonstrated gas formation in the paratracheal area, suggestive of a necrotizing infection. The patient underwent two rounds of wound debridement with extensive involvement of the paratracheal musculature and airway cartilage necrosis tracking into the mediastinum. Airway involvement included a tracheal defect of at least 2.5 cm in the superior inferior direction, as well as erosion of the posterior wall of the trachea. The patient was transitioned to comfort care 26 days after his initial admission and died the following day. **Conclusions:** Percutaneous tracheostomy is commonly performed in critically ill patients requiring chronic ventilation. This case demonstrates the rare presentation of a necrotizing soft tissue infection with extensive tracheal involvement after a percutaneous tracheostomy.

39. Predictors of Otolaryngology Applicant Success Using the Texas STAR Database

Nicholas R. Lenze, BS, Chapel Hill, NC; Angela Mihalic, MD, Dallas, TX; Adam Zanation, MD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the predictors of a successful match into residency in otolaryngology from 2018 to 2020.

Objectives: To examine characteristics of matched versus unmatched otolaryngology residency applicants from 2018 to 2020. **Study Design:** Retrospective cohort study using self-reported data from the Texas STAR database. **Methods:** Differences in characteristics between matched and unmatched applicants were examined using chi square and two sided t-tests. Logistic regression models were used to assess predictors of a successful match. **Results:** A total of 315 otolaryngology residency applicants responded to the survey of whom 274 matched (87%) and 41 did not match (13%). Matched applicants had a significantly higher mean USMLE step 1 score (p=0.016) and step 2 CK score (p=0.007). There were no significant differences in AOA status (45% vs. 36%; p=0.207), mean number of applications submitted (70 vs. 69; p=0.544), and mean number of away rotations (2.1 vs. 2.0; p=0.687) between matched and unmatched applicants. Significant predictors of a successful match included receiving honors in 5 or more clerkships (OR 2.0, 95% CI 1.0-4.0; p=0.040), receiving honors in an ENT clerkship (OR 3.7, 95% CI 1.0-12.9; p=0.044), and having 3 or more peer reviewed publications (OR 2.3, 95% CI 1.1-4.5; p=0.020). The majority of applicants (79.9%) matched at a program where they either did an away rotation, had a personal geographic connection, or attended medical school in the same geographic region. **Conclusions:** Board scores, excelling on clinical rotations, and having productive research experience appear to be strong

predictors of a successful match in otolaryngology. The majority of applicants report a personal or geographic connection to the program at which they match.

40. Adverse Event Reporting in Otolaryngology

Nicola M. Pereira, BA, New York, NY; Anthony P. Sclafani, MD, New York, NY; Ashutosh Kacker, MD BS, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand and identify high risk domains for adverse events in otolaryngology.

Objectives: Adverse events are common occurrences in hospitals that detract from quality of care and patient safety. There are few data on errors in otolaryngology and even fewer data comparing otolaryngology to other services. **Study Design:** Retrospective review of adverse event reporting database. **Methods:** We retrospectively reviewed adverse event reporting data collected across a regional hospital network from July 2014 to August 2017. We examined categories of adverse events reported most commonly in ENT and compared the events reported in ENT to those reported across all other departments. Descriptive analysis and the paired t-test were used to analyze the data. **Results:** 291 total adverse events were reported in ENT departments during the period studied compared to 58,219 events reported across all other specialties. In ENT, the most commonly reported adverse events occurred in the perioperative setting, followed by equipment and medical device issues and, lastly, airway management. Across all other departments, the categories with the highest number of adverse events included medication and fluid errors, falls, and safety and security events. Statistical comparison showed that ENT departments had significantly higher proportions of adverse events in the perioperative setting and related to airway management and significantly lower proportions of events related to diagnosis and treatment ($p = 0.004$), falls ($p < 0.001$), lab results and specimens ($p = 0.001$), medication and fluids ($p < 0.001$), and safety and security ($p < 0.001$). **Conclusions:** Errors related to airway management and perioperative practices occur with a higher frequency in ENT than in other departments across hospitals. It is important to analyze patterns in adverse event reporting in surgical specialties, to ensure the development of appropriate quality improvement initiatives.

41. Opportunities for Quality Improvement in ENT

Nicola M. Pereira, BA, New York, NY; Ashutosh Kacker, MD BS, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss common themes in adverse event reporting in ENT; and 2) identify opportunities for quality improvement demonstrated across other medical specialties and express understanding of how these initiatives can be applied to ENT services.

Objectives: Adverse events are common occurrences in ENT practices, yet there is relatively little data on quality improvement initiatives that can address the underlying causes of these events. A recent study published by the authors demonstrated that adverse events in ENT commonly involve the perioperative setting, airway management, and equipment related issues. This study aims to identify opportunities for quality improvement focused on these domains. **Study Design:** Literature review and analysis. **Methods:** A literature review of quality improvement practices related to the perioperative setting, surgical equipment, and airway management was conducted. Applicable quality improvement studies and initiatives were gathered from the literature and assessed for relevance and potential for implementation in ENT services. **Results:** Analysis of quality improvement practices from various surgical specialties yielded many potential strategies for addressing common adverse events in ENT. In the perioperative space, ENT services should focus on reducing procedure delays and cancellations, count discrepancies, and consent issues. Additional efforts should be directed towards proper function, availability, and personnel training with regards to surgical equipment. Airway management initiatives should focus on equipment availability and risk stratification of potentially complicated patients. Finally, feedback for adverse event reporters is an important component in reducing future ENT adverse events. **Conclusions:** Despite the relative lack of quality improvement research in ENT, data from other surgical specialties can offer valuable insights for improving patient safety and avoiding adverse events.

42. Epiglottitis/Supraglottitis in the Post-Haemophilus Influenzae (Hib) Type B Vaccination Era: Is it Time to Consider a Booster Vaccine?

Corinne Pittman, BA, Washington, DC; Olubode Olufajo, MD MPH, Washington, DC; Millicent Collins, MD, Washington, DC; Earl Harley, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand changes in the trajectory of epiglottitis/supraglottitis incidence among adults who received the haemophilus influenzae (Hib) type B vaccine since its introduction to the United States in 1985; 2) understand sociodemographic factors that contribute to the need for intubation and tracheotomy among adults who received the childhood Hib vaccine and are hospitalized with epiglottitis/supraglottitis of haemophilus influenzae etiology; 3) consider the potential impact of a booster vaccine against haemophilus influenzae.

Objectives: To identify national trends in the incidence of epiglottitis/supraglottitis among adults who received the haemophilus influenzae type B (Hib) vaccine during childhood. **Study Design:** Retrospective review of the National (Nationwide) Inpatient Sample (NIS) dataset from 1994 to 2017. **Methods:** The NIS database was searched using ICD-9 CM and ICD-10 CM codes for epiglottitis/supraglottitis with and without obstruction. The primary analyses performed included Pearson's chi square tests and multivariate linear regressions. **Results:** Between 2013 and 2017 we identified a 25% increase in the incidence of epiglottitis/supraglottitis among 24,600 adults ages 18 through 40. A total of 292 (1.2%) adults developed epiglottitis of haemophilus influenzae etiology, and 50% received the haemophilus influenzae (Hib) type B vaccine during childhood. During hospitalization for epiglottitis, 11.8% of adults underwent intubation, and 5.60% underwent a tracheotomy. On multivariate regression analysis, adults who developed epiglottitis/supraglottitis of haemophilus influenzae etiology had greater odds of requiring intubation (OR 3.57; 95% CI, 2.47 to 5.17) or tracheotomy (OR 2.08; 95% CI, 1.10-3.92). Significant indicators for intubation or tracheotomy included male gender, Black and Hispanic race/ethnicity and Medicaid health insurance (OR 1.12, 1.23, 1.21, 1.31, respectively). **Conclusions:** Despite establishment of the Hib vaccine over 30 years ago, our findings demonstrate a steady rise in epiglottitis cases among adults who received the childhood Hib vaccine. Although only 292 (1.2%) adults had reports of epiglottitis due to haemophilus influenzae, this value is likely underreported because of billing and coding methodology. In light of the rising incidence, our investigation could be a starting point for consideration of a booster vaccine.

43. Evaluation of Long Term Outcomes of Fat Graft Myringoplasty Compared to Patch Myringoplasty

Vibhav N. Prakasam, BS, Boston, MA; Mark A. Vecchiotti, MD, Boston, MA; Andrew R. Scott, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should have further insight on whether performing a patch myringoplasty to repair a perforated tympanic membrane is more effective for long term closure and other outcome measures compared to a fat graft myringoplasty.

Objectives: Tympanic membrane perforations can be repaired via myringoplasty with different surgical approaches. One method is to harvest an autologous fat graft from behind the earlobe to plug into the membrane. Another option is to patch it using a foreign material, such as paper, absorbable gelatin film (Gelfoam), or esterified hyaluronic acid (EpiDisc). This study seeks to determine if there is a difference in outcomes between patients who underwent fat graft myringoplasty and patients who underwent patch myringoplasty. **Study Design:** This was a retrospective data review of pediatric cases of fat graft and patch myringoplasties performed by two pediatric otolaryngologists. **Methods:** The database of an urban, pediatric otolaryngology practice was utilized to identify patients who underwent these procedures and to investigate followup data. Patients were stratified into demographics and outcome measures were determined. **Results:** Between January 2011 and March 2020, 235 ears were repaired on 195 children who met inclusion criteria (n=65 fat, n=170 patch). The fat graft group was significantly older (mean age 7.49 years vs 5.41 years, $p<0.01$) with significantly less secondhand smoke exposure (n=2 vs n=20, $p<0.05$) and significantly less loss to followup (n=0 vs n=13, p=0.03). There were no other differences in demographics. Furthermore, there was no significant difference between groups in postoperative infection or permanent closure of the tympanic membrane. **Conclusions:** Despite the greater smoke exposure, the patch myringoplasty group displayed no difference in outcome compared to the fat graft group. Perhaps with a larger fat graft sample size, a difference would be noted. Cost and other outcomes can also be further investigated.

44. The Impact of Social Deprivation on Otolaryngology Outpatient Satisfaction Using the Press Ganey Outpatient Medical Practice Survey

Taylor S. Redding, BA, Salt Lake City, UT; Andrew R. Stephens, BS, Salt Lake City, UT; Nikolas H. Kazmers, MD MSE, Salt Lake City, UT; Albert Park, MD, Salt Lake City, UT

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand non-modifiable and modifiable factors that influence patient satisfaction, specifically how patient socioeconomic factors and variable wait time impact patient experiences.

Objectives: Our aim was to determine whether social deprivation - the level of socioeconomic disadvantage in a geographical area - is associated with satisfaction of otolaryngology outpatient visits, measured by the Press Ganey Outpatient Medical Practice Survey (PGOMPS) Total Score. **Study Design:** Retrospective cohort study. **Methods:** We reviewed survey scores for unique new outpatient visits between January 1, 2014 and December 31, 2018 at a single tertiary academic institution. Due to the high ceiling effects of the PGOMPS, satisfaction was defined as achieving a calculated perfect total score (100). Social deprivation was measured using the 2015 Area Deprivation Index (ADI) Neighborhood Atlas national percentages. Multivariate binary logistic regression analyses were used to identify factors correlated with patient satisfaction. **Results:** Multivariate analysis for the adult cohort revealed a decreased odds of achieving satisfaction for each decile increase in ADI (OR 0.96; P = 0.038), but not for the pediatric cohort (OR 0.997; P = 0.954) independent of age, sex,

wait time and insurance type. Additionally, adult patients were 40.9% less likely (P < 0.001) and pediatric patients were 49.8% less likely (P < 0.001) to report being satisfied for each 10 minute increase in wait time. **Conclusions:** Increased social deprivation was an independent predictor of lower satisfaction for adult otolaryngology outpatients, but not for children. Increased wait time was also a significant indicator for patient dissatisfaction in both the pediatric and adult cohorts. These outcomes should be considered by healthcare administrators when interpreting patient satisfaction scores and making policy decisions and offer further support to improve healthcare inequalities.

45. Continuous Positive Airway Pressure Related Corneal Abrasion and Ocular Irritation: Case Report and Review of the Literature

Leighton Forest Reed, MD, Memphis, TN; Robert Vestal, MD, Memphis, TN; Jesse Wesberry, MD, Memphis, TN; M. Boyd Gillespie, MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to investigate continuous positive airway pressure related ocular complications and propose variations of therapy or alternative therapy to resolve or improve the clinical outcome.

Objectives: Obstructive sleep apnea (OSA) is a common condition. Continuous positive airway pressure (CPAP) is the gold standard of treatment but adherence is poor. Ocular irritation is an uncommon cause of nonadherence secondary to discomfort. Leaking masks are a source reported to induce ocular irritation, ocular dryness, and conjunctivitis. Ocular dryness can progress to corneal abrasion increasing risk for infection, corneal scarring, and decreased vision. The objective of this study is to present the first reported case of CPAP related corneal abrasion, to the author's knowledge, and to investigate CPAP related ocular complications as presented in the literature. **Study Design:** Case report and literature review. **Methods:** Case report and literature review. **Results:** Our patient reported two years of significant subjective improvement of her obstructive sleep apnea symptoms with the use of CPAP. She presented secondary to recent difficulties with mask leakage causing ocular dryness. Symptoms progressed, and the patient developed corneal abrasions due to persistent mask leakage and had to discontinue her CPAP. Unlike previous reports of CPAP related ocular irritation, our patient does not have previous ophthalmologic disease or special contacts. She has tried various CPAP masks and other modalities to mitigate these symptoms without avail. She will now attempt using an oral appliance with surgical alternatives available. **Conclusions:** CPAP mask leakage can induce ocular dryness increasing risk for further clinical sequela. Mask variations may resolve symptoms by reducing leakage, but alternative therapy may be required if no improvement. These symptoms must be addressed as CPAP nonadherence and ocular irritation increase risk of more severe disease.

46. The Impact of Masks during the Current Coronavirus Pandemic on Speech Recognition Ability in Patients with and without Hearing Loss

Elizabeth N. Ritter, MD, Chapel Hill, NC; Craig Miller, MD, Chapel Hill, NC; Princess Onuorah, BS, Chapel Hill, NC; Brent A. Senior, MD, Chapel Hill, NC; Adam Kimple, MD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how masks impact a patient's ability to hear in both an ambulatory and hospital setting during the current coronavirus pandemic.

Objectives: The purpose of this study is to understand how masks, specifically surgical and N95 masks, impact a patient's ability to hear in an ambulatory and hospital setting. **Study Design:** Participants with and without subjective hearing loss were recruited from both an ambulatory and inpatient hospital setting to complete a listening task. Participants were instructed to repeat back the word heard from a voice recording, which contained a list of common spondaic words recorded in 1 of 3 conditions: no mask, surgical mask, or N95 mask. The percentage of correct responses was then collected. Information on subjective hearing loss was collected from participants in order to compare hearing loss versus no hearing loss groups. **Methods:** Participants with and without subjective hearing loss were recruited from both an ambulatory and inpatient hospital setting. A standardized digital recording of 36 spondaic words was presented the patients. Each word was recorded in one of three conditions: no mask, surgical mask, and an N95 mask. Recording was presented to participants in a clinic and/or inpatient hospital room at a normal speech intensity level (45-65 dB) using both a male and female speaker. Participants were then instructed to repeat back the word heard. The percentage of correct responses was recorded. **Results:** A total of 48 participants were included in this study: 44 ambulatory and 4 inpatient participants. The mean age was 48 years (range 18-93 years), with a slight female preponderance (54%). Subjective hearing loss was reported by 25 (54.2%) patients. Of those with subjecting hearing loss, 19 (74%) reported bilateral hearing loss and 10 (40%) indicated regular hearing aid use. The average score across all participants was 76%. Among participants with subjective hearing loss, the average score was of 63%, whereas those without subjective hearing loss had an average score of 89%. The lowest scores were observed with the N95 mask condition (63%), versus surgical mask (79%) and no mask (89%). Interestingly, the lowest score recorded was in the hearing loss group when presented with female speaker wearing N95 mask (40%). **Conclusions:** Our results suggest that N95 masks in particular result in decreased hearing among all patients, however, this difficulty is most pronounced particularly in patients with baseline subjective hearing loss. Furthermore, our

results suggest that patients have an even greater difficulty when presented with a female speaker. During the Covid-19 pandemic, it is imperative to maintain appropriate communication with our patients. Given that masks are a barrier to effective communication, it is important for providers to be aware of this phenomenon and make every effort to ensure adequate care is given to all of our patients, particularly those with hearing loss such as is commonly encountered in an otolaryngology practice. Future efforts should be focused on advancing technologies to improve communication between patients and their providers.

47. Very Low Energy Monopolar Tonsillectomy Significantly Reduces Post-Tonsillectomy Hemorrhage Compared to Standard Energy "Hot" Tonsillectomy

Steven David Shotts, MD FACS, Louisville, KY; Donald Vincent Welsh, MD FACS, Louisville, KY; Aisaku Nakamura, MS, Lexington, KY; Arnold J. Stromberg, PhD, Lexington, KY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the association between energy and post-tonsillectomy hemorrhage.

Objectives: To compare rates of post-tonsillectomy hemorrhage (PTH) between a very low energy transfer monopolar tonsillectomy technique (VLET) and standard energy tonsillectomy techniques. **Study Design:** Retrospective case control study. **Methods:** All tonsillectomies performed by practice physicians during the period January 1, 2010, to August 31, 2019, were identified. Those patients experiencing PTH requiring surgical intervention (PTHRSI) were examined. Three groups were compared based on surgeon technique utilization: exclusive standard energy monopolar (standard group), the VLET group, and exclusive "hot" technique without exclusive monopolar use (mixed "hot"). **Results:** During the study period 11,348 tonsillectomies were performed (4427 standard, 1374 VLET, 5547 mixed "hot"), and 167 (1.47%) patients experienced PTHRSI [14 primary (24 hr), 12 repeat (>1PTHRSI/pt)]. Compared to the standard group secondary and total PTHRSI rates (1.47%, 1.60%), the mixed "hot" group experienced similar rates (1.57%, p=0.54; 1.68%, p=0.64), but the VLET group experienced significantly lower rates (0.15%, p = 0.0026, adjusted OR 0.114 [0.028-0.469]; 0.22%, p=0.0017, adjusted OR 0.156 [0.049-0.497]). Age was a significant risk factor for both secondary and total PTHRSI (p=0.0025, p=0.0006, adjusted OR 1.019/yr [1.01-1.03]). No significant difference in rate of primary PTHRSI was seen collectively or in any age group. The <12yo VLET Group experienced 0 episodes of secondary PTHRSI and a total PTHRSI rate of 0.09% in 1060 tonsillectomies. **Conclusions:** Standard energy techniques had an adjusted odds ratio over 8-fold higher for secondary PTHRSI and over 6-fold higher for total PTHRSI compared to the minimized energy transfer VLET technique.

48. Prophylactic Migraine Treatment Outcomes in Patients with Persistent Postural Perceptual Dizziness

Sina Soltanzadeh-Zarandi, BS, Irvine, CA; Khodayar Goshtasbi, MS, Irvine, CA; Mehdi Abouzari, MD PhD, Irvine, CA; Ariel Lee, BS, Irvine, CA; Shahrnaz Jamshidi, MD, Irvine, CA; Hamid R. Djalilian, MD, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the potential use of migraine prophylactic medication in treating patients with persistent postural perceptual dizziness and compare the therapeutic potential of such medications with alternative treatment regimens.

Objectives: To elucidate the therapeutic efficacy of prophylactic migraine treatment for patients with persistent postural perceptual dizziness (PPPD). **Study Design:** Retrospective case series. **Methods:** Patients who presented with a diagnosis of PPPD and received migraine treatment with a minimum of 6 months of followup were included. Patients were initially instructed to follow the migraine diet/lifestyle change and to take riboflavin and magnesium. If their symptoms persisted, patients were prescribed migraine prophylactic medication (e.g., nortriptyline, verapamil, and/or topiramate) with dose escalation if needed. The main outcome measure was reduction or resolution of PPPD symptoms based on the dizziness handicap inventory. **Results:** Nineteen patients (79% females) with a mean age of 49 ± 15 years (range, 26-78) were included. The mean followup was 18 ± 23 months (range, 6-92). Significant improvement occurred in 14 patients (74%) with two patients (10%) achieving complete symptom resolution with migraine therapy. Improvements in symptoms were not associated with gender, age, or a history of tinnitus, dizziness, and light/sound sensitivity at presentation. However, a history of aural pressure was associated with no improvements in PPPD symptoms (p = 0.02). **Conclusions:** Management of PPPD with prophylactic migraine treatment can provide long term relief for patients, which may allude to shared pathophysiology between migraine and PPPD as well as possible novel therapeutic methods for treating patients with PPPD.

49. Association between Anemia and Complications Following Tracheostomy

Parisorn Thepmankorn, BS, Newark, NJ; Chris B. Choi, BS, Newark, NJ; Aakash Shah, BS, Newark, NJ; Aksha Parray, BA, Newark, NJ; Boris Paskhover, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss how anemia is associated with rates of complications following tracheostomy.

Objectives: To investigate the association between anemia and rates of postoperative complications in patients undergoing tracheostomy. **Study Design:** Retrospective database review. **Methods:** The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) databases from 2005-2015 were reviewed, selecting for otolaryngology patients undergoing tracheostomy. Chi square and Fisher's exact tests were used for univariate analysis. Multivariate logistic regression was used to assess the independent effect of covariates on postoperative complication rates. **Results:** 1,823 patients who underwent tracheostomy with an otolaryngologist attending and known preoperative hematocrit (Hct) were identified. Patients were subdivided into two cohorts based on hematocrit: non-anemic (male: Hct ≥39%, female: Hct ≥36%) and anemic (male: Hct <39%, female: Hct <36%). Univariate analysis of postoperative complications revealed anemic patients had significantly higher rates of septic shock (p=0.017), bleeding (p<0.001), myocardial infarction (p<0.001), and death (p=0.003); anemics also had higher rates of medical, surgical, and overall postoperative complications (all p<0.001). Multivariate regression analysis found that anemia was significantly associated with increased surgical complications (odds ratio [OR] 3.430, 95% CI 1.918-6.136, p<0.001) and overall postoperative complications (OR 3.112, 95% CI 1.750-5.535, p<0.001). Multivariate analysis of individual postoperative complications showed that anemia was associated with increased rates of bleeding (OR 6.163, 95 CI 3.244-11.707, p<0.001). **Conclusions:** This study reveals that anemia is associated with increased bleeding, surgical complications, and overall postoperative complications in tracheostomies in otolaryngology cases. Anemia may be a useful preoperative marker for predicting postoperative course of otolaryngology associated tracheostomies.

50. Association between Surgical Specialties and Postoperative Complications Following Planned Tracheostomy

Parisorn Thepmankorn, BS, Newark, NJ; Chris B. Choi, BS, Newark, NJ; Aakash Shah, BS, Newark, NJ; Aksha Parray, BA, Newark, NJ; Boris Paskhover, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss how surgical specialty is associated with rates of complications following planned tracheostomy.

Objectives: To investigate the association between surgical specialty and rates of postoperative complications in patients undergoing planned tracheostomy. **Study Design:** Retrospective database review. **Methods:** The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) databases from 2005-2015 were reviewed, selecting for all patients undergoing planned tracheostomy. Chi square and Fisher's exact tests were used for univariate analysis. Multivariate logistic regression was used to assess the independent effect of covariates on postoperative complication rates. **Results:** 2,372 patients who underwent planned tracheostomy with known attending specialty on the principal operation were identified, excluding patients who had undergone bronchoscopy. Patients were subdivided into two cohorts based on surgical specialty: otolaryngology (ENT) and non-ENT specialties. Univariate analysis revealed that non-ENT specialties (4.6%) had higher rates of reintubation (p=0.018) than ENT (2.3%). Non-ENT specialties (23.8%) also had higher rates of reoperation (p=0.025) than ENT (18.8%). Non-ENT cases were significantly associated with increased medical complications (OR 2.543, 95% CI 1.381-4.684, p=0.003). Multivariate analysis of individual postoperative complications showed that ENT cases were associated with increased rates of bleeding (OR 2.417, 95% CI 1.251-4.672, p=0.009); non-ENT cases were associated with increased rates of sepsis (OR 3.614, 95% CI 1.130-11.555, p=0.030) and ventilator use >48 hours (OR 7.854, 95% CI 3.369-18.307 p <.001). **Conclusions:** Non-ENT specialties have a broader range of complications associated with planned tracheostomies than ENT. Surgical specialty may help predict postoperative course of planned tracheostomy and guide monitoring for complications.

51. Malpractice Trends in Otolaryngology from 2010-2019

Briana E. Vamosi, BA, Cincinnati, OH; Alice L. Tang, MD, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the trends in malpractice litigation raised against otolaryngologists. Additionally, we aimed to analyze the proportion of each otolaryngology subspecialty that have been involved in litigation and to further characterize the injury and the outcome of each case.

Objectives: This study sought to identify medical malpractice claims involving otolaryngologists in the last decade. **Study Design:** Retrospective case series. **Methods:** The legal database LexisNexis was used to identify malpractice claims against otolaryngologists from January 1, 2010 to December 31, 2019. Information extracted from the cases included: injury, legal claim, type of resolution, award amount, and length of time between injury and legal decision. **Results:** A total of 223 cases were identified of which 91 cases met inclusion criteria for analysis. The most common injuries that were the reason for litigation included death (25.3%), nerve injury (15.4%), vision impairment (13.2%), and need for additional surgery/treatment (12.1%). For 59.3% (54/91) cases, the case resolved in the otolaryngologist's favor, while another 17.6%

(16/91) resulted in a mixed decision. The remaining 23.1% (21/91) of cases resulted in plaintiff verdicts with an average award of 3.9 million dollars (range: 13.0-.015, SD=4.65). Below standard of care was the most common claim raised and was asserted a total of 81 times out of a total of 128 claims (63.3%). Other claims that were asserted included lacked informed consent (20.3%), improper diagnosis (7.8%), unnecessary surgery (4.7%), and failure to consult (2.3%). **Conclusions:** Malpractice claims take years to reach conclusion regardless of how they are resolved, but when claims do go to trial, otolaryngologist defendants are winning in the majority of cases. While claims that the care provided was below the standard of care was expected, the significant number of informed consent related claims suggests an area that otolaryngologists can mitigate malpractice risk.

52. Prison Inmate Civil Rights Claims Related to Otolaryngology Pathology

Briana E. Vamosi, BA, Cincinnati, OH; Alice L. Tang, MD, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to identify what civil rights claims are being raised due to otolaryngology related health concern.

Objectives: This study intends to determine circumstances that lead to litigation involving prisoners experiencing otolaryngology pathology. **Study Design:** Retrospective case series. **Methods:** The database LexisNexis was used to identify civil rights claims raised by prison inmates related to lack of health access for otolaryngology based health concerns in the year of 2019. Each case was then evaluated individually to determine diagnosis, legal claim, and legal outcome. Descriptive statistics were applied. **Results:** A total of 4,730 cases were found, of which 37 cases involved otolaryngology (0.78%). This study found that all claims were raised for deliberate indifference, which is a claim where the plaintiff must prove that the prison or prison officials were aware of a serious medical condition and failed to take action. Twenty-nine cases were decided for the defendant (29/37, 78.4%), four for the plaintiff (4/37, 10.8%), and four with a mixed outcome (4/37, 10.8%). Trauma related cases were the most common causes with 13 cases (13/37, 35.1%). A total of 41 medical complaints were raised, including complaints of failure to consult (12/41, 29.3%), failure to provide subspecialist recommended care (12/41, 29.3%), delayed treatment (12/41, 29.3%), and refused treatment (5/41, 12.2%). **Conclusions:** Prison inmates experience a unique barrier to healthcare which can lead to delays in care--especially for care requiring subspecialty expertise. While the courts found in the majority of cases that there was not a civil rights violation, the number of cases in one year for this subspecialty suggests the need for a closer look into barriers faced when inmates need attention for otolaryngology complaints.

53. Paying to Play? The Relationship Between Open Access Article Publishing and Number of Citations in Otolaryngology

David W. Wassef, BS, Newark, NJ; Gregory L. Barinsky, PharmD, Newark, NJ; Sara Behbahani, MS, Newark, NJ; Sudeep Peddireddy, BS, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the relationship between open access publishing status and subsequent citations, and how this paradigm of publishing can help spread new findings in otolaryngology.

Objectives: The purpose of this study is to compare the number of citations received by open access articles versus subscription access articles in the otolaryngology literature. **Study Design:** Retrospective review of an integrated research database. **Methods:** Using the Dimensions research database, we examined articles indexed to PubMed with at least five citations published in 2018. We included articles from Otolaryngology-Head and Neck Surgery, The Laryngoscope, JAMA Otolaryngology-Head and Neck Surgery, Annals of Otology, Rhinology, and Laryngology, and American Journal of Otolaryngology. Multivariate Poisson regression modelling was used to adjust for journal, article type, and topic. Articles categorized as practice guidelines, position statements, or retractions were excluded as potential outliers. **Results:** 137 open access articles and 337 subscription access articles meeting inclusion criteria were identified, with a median citation number of 8 (IQR 6-11). The most common article type was original investigation (82.5%) and the most common study topic was head and neck (28.9%). Open access articles had a higher median number of citations at 9 (IQR 6-13) when compared to subscription access articles at 7 (IQR 6-10) ($p<0.001$). Open access status was significantly associated with a higher number of citations than subscription access articles when adjusting for journal, article type, and topic (B=0.272, CI 0.194-0.500, $p<0.001$). **Conclusions:** Although they comprised a minority of articles examined in this study, open access articles are associated with a higher number of citations than subscription access articles. Open access publishing may facilitate the spread of novel findings in otolaryngology.

Head and Neck

54. Social Determinants of Health and Adherence to Followup Guidelines in Head and Neck Malignancies

Tooba Alwani, BA, Boston, MA; Jennifer N. Shehan, MD, Boston, MA; Jessica L. LeClair, BS, Boston, MA; Taylor F. Mahoney, MA, Boston, MA; Anand K. Devaiah, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the barriers that still exist in followup care for head and neck cancer patients.

Objectives: Proper followup care in head and neck cancers is critical in managing post-treatment complications and detecting recurrences. However, cancer survivors with lower socioeconomic status (SES) report poorer quality of followup care. The study goal is to explore how SES affects followup care at an institution that has developed systems to adapt to the special needs of vulnerable populations. **Study Design:** Retrospective data review. **Methods:** A systematic chart review of 1428 head and neck cancer patients diagnosed in the past 10 years. Data was analyzed using ANOVA, chi square, two sample t-test and simple linear regression. **Results:** The average length of followup time in months and total number of followups over 5 years was 32.94 (34.58) and 9.25 (7.87), respectively. There was no significant difference in followup care between US vs. non-US born and English vs. non-English speaking patients. Race/ethnicity was associated with patients being loss to follow-up ($p = 0.01$). There was a significant difference in length of followup across insurance status ($p = 0.02$). County median household income was not correlated with followup care. Residing in a county with a greater percentage of people holding a bachelor's degree or higher was associated with greater followup length and frequency ($p = 0.01$). **Conclusions:** While income, primary language, and country of birth do not appear to impact followup care, race/ethnicity, insurance status and educational attainment are important contributors to disparities in followup care. This study highlights barriers to care that still need to be addressed to ensure better health outcomes.

55. Racial and Ethnic Differences in Demographics, Treatments, and Survival in Dermatofibrosarcoma Protuberans of the Head and Neck

Sara Behbahani, MS, Newark, NJ; Oyinkansola Adedipe, BA, Newark, NJ; Judith Ezike, BA, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Wayne D. Hsueh, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: Learn about the differences in clinical presentation, treatment, and survival in patients with dermatofibrosarcoma protuberans of the head and neck.

Objectives: Dermatofibrosarcoma protuberans (DFSP) of head and neck (HN) is a rare, locally infiltrative sarcoma with reported higher incidence among African Americans. This study analyzes the racial and ethnic differences in demographics, treatment, and survival of HN DFSP. **Study Design:** Database study. **Methods:** 778 cases were identified in the National Cancer Database from 2004 to 2016. Chi square, Kaplan-Meier, and Cox proportional hazard models were performed to analyze differences in demographics, survival, and prognostic factors. **Results:** Whites represented 67.6% of patients, followed by Blacks (14.5%), Hispanics (11.2%), and Asians (4.2%). Whites were diagnosed at an older age (43.8 ± 16.3) than Blacks (38.9 ± 13.3), Hispanics (37.9 ± 14.6), and Asians (40.9 ± 18.1) ($p=0.02$). Most patients were male (55.8%; p0.05). A higher proportion of Blacks (13%), Asians (12%), and Hispanics (14%) were uninsured as compared to whites (6%; $p<0.0001$). A significant proportion of Black patients (41%) and Hispanics (33%) had annual incomes below $38,000 as compare to Whites (12%; p0.05). There were no significant racial/ethnic differences in 5 year (95.9%) and 10 year (91.8%) overall survival (OS) ($p=0.11$). When adjusting for confounders, race/ethnicity was not an independent predictor of OS. **Conclusions:** Significant racial/ethnic differences exist in socioeconomic status in patients with DFSP of the HN. Non-white patients present at an earlier age, but there were no significant differences in treatment or survival.

56. Clinicopathologic Factors and Survival of Laryngeal Verrucous Carcinoma in the United States

David Avery Cohen, BA, Newark, NJ; Kirolos M. Georges, BA, Newark, NJ; Gregory L. Barinsky, PharmD, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Wayne D. Hsueh, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact of patient demographics, clinicopathologic factors, and treatment options on the survival of laryngeal verrucous carcinoma.

Objectives: Laryngeal verrucous carcinoma (LVC) is a rare malignancy with limited reports. This study describes the patient demographics, clinicopathologic characteristics, and treatment modalities that influence survival of patients with LVC. **Study Design:** Retrospective study of a national cancer registry. **Methods:** The National Cancer Database was used to

extract 1340 cases of LVC between 2004-2016. These cases were analyzed using Kaplan-Meier (KM) and Cox proportional hazards to identify factors that impact survival. **Results:** The mean age of LVC patients was 61.2 years (± 11.9). 71.2% of patients underwent surgery, of which the majority were local excision (72.6%) followed by total laryngectomy (10.7%). Five year overall survival (5YOS) was 68.7% with a median survival of 9.0 years. Surgery alone had the highest 5YOS (76.1%), followed by surgery and chemoradiotherapy (CRT) (73.8%), and surgery and radiotherapy (68.9%). Age, race, Charlson-Deyo comorbidity score (CDCS), insurance, grade, stage, treatment, and surgery type were significant predictors of 5YOS on KM analysis ($p<0.05$). On Cox multivariate analysis, factors associated with poorer prognosis were age ≥ 80 (HR 4.664, $p<0.001$), Black race (HR 1.589, $p=0.008$), CDCS ≥ 2 (HR 2.795, $p<0.001$), and nodal disease (HR 3.006, $p<0.001$). Compared to surgery alone, treatment modalities associated with worse survival were radiotherapy alone (HR 1.715, $p=0.001$) and chemotherapy alone (HR 9.337, $p<0.001$). Surgery and CRT was associated with significant survival benefit (HR 0.391, $p=0.036$). **Conclusions:** For LVC, surgery and CRT were associated with improved survival compared to surgery alone. Older age, Black race, higher comorbidity score, and nodal disease were associated with poorer prognosis.

57. Postoperative Consequences of Cancer Cachexia after Head and Neck Free Flap Reconstruction

Kyle P. Davis, BS, Indianapolis, IN; Leah J. Novinger, MD, Indianapolis, IN; Alexander J. Jones, MD, Indianapolis, IN; Kendall M. Burgett, BS, Indianapolis, IN; Andrea Bonetto, PhD, Indianapolis, IN; Micheal G. Moore, MD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the postoperative consequences of cachexia on head and neck cancer free flap reconstruction patients.

Objectives: Determine the impact of preoperative cachexia on postoperative outcomes in patients with head and neck cancer undergoing resection and free flap reconstruction. **Study Design:** Single institution, retrospective cohort. **Methods:** Consecutive, adult patients from 01/01/2015-11/01/2019 undergoing head and neck cancer resection with free tissue reconstruction were included. Patients with metastatic or concurrent primary malignancy were excluded. Patients were stratified by the presence or absence of preoperative cachexia. Preoperative, intraoperative, and postoperative variables were collected. Univariate and multivariate analyses were conducted to determine patients' and perioperative variables' impact on postoperative complications. **Results:** Out of 189 total patients, 80 (42.3%) had preoperative cachexia. The cachectic group included predominantly males (86.3% vs. 67.9%, $p=0.0037$) with lower BMI (23.9 vs. 28.5 kg/m2, $p<0.0001$) and greater incidence of alcohol abuse (41.3% vs. 23.9%, $p=0.0168$). The cachexia group had higher proportions of squamous cell carcinomas (91.3% vs. 71.6%, $p=0.0008$) and aerodigestive tumors (80.0% vs. 61.5%, $p=0.0068$). Postoperatively, cachectic patients more often acquired sepsis (10.0% vs. 0.0%, $p=0.0008$), partial flap loss (11.3% vs. 1.8%, $p=0.0095$), and discharge to a rehabilitation facility (56.3% vs. 29.4%, $p=0.0003$). The cachexia group had an elevated rate of ACS-NSQIP complications (71.3% vs. 56.0%, $p=0.0345$) and higher number of total ACS-NSQIP complications (1.6 vs. 1.2, $p=0.0480$). After multivariate regression, cachexia remained a significant predictor of incurring an ACS-NSQIP complication ($p=0.019$, OR [95% CI] = 3.45 [1.23-9.63]). **Conclusions:** Preoperative cachexia was associated with increased postoperative complications in head and neck cancer free flap reconstruction patients.

58. Indolent Covid-19 Infection Resulting in Unexpected Early Postoperative Complications Following Transoral Robotic Surgery

Kristen A. Echanique, MD, Los Angeles, CA; Vivian Wung, BS, Los Angeles, CA (Presenter); Abie H. Mendelsohn, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand immunosuppressive changes that occur following surgery and how this impacts patients with subclinical SARS-CoV-2 infection.

Objectives: To describe an unusual manifestation of subclinical Covid-19 and immunosuppressive changes following surgery. **Study Design:** Case report and literature review. **Methods:** Literature review. **Results:** Within 48 hours of preoperative Covid-19 testing, a 35 year old male underwent transoral robotic surgical resection of a progressively enlarging parapharyngeal space nerve sheath tumor. Surgical resection was uncomplicated and the patient was discharged home in stable condition on postoperative day one. On postoperative day two, the patient began experiencing persistent cough unresponsive to antitussives. He developed surgical site dehiscence and hemorrhage on postoperative day seven and was admitted for observation. Repeat nasopharyngeal swab at readmission was positive for SARS-CoV-2 nucleic acid. At our institution, the internal validity of our nasopharyngeal SARS-CoV-19 testing is very good, with a negative predictive value of 99.8%. As surgery is known to impair cell mediated immunity due to the interaction of surgical stress and drugs used for postoperative pain control, this case suggests conversion from subclinical Covid-19 infection to full symptomatic disease after surgically induced immune suppression. **Conclusions:** While preoperative Covid-19 testing is essential, a negative result does not preclude infection and may be due to inadequate viral RNA in the nasopharynx at the time of testing. In the coming months, we will likely see a growing number of perioperative patients who begin to manifest signs and symptoms

of subclinical preoperative infection in the postoperative period. The possibility of an established Covid-19 negative patient converting to Covid-19 positive early on within the perioperative period must be considered.

59. Predictors of Morbidity and Mortality in Older Adult Patients (70+) Undergoing Free Flap Head and Neck Reconstruction

Samer T. Elsamna, BA, Newark, NJ; Ghayoour Mir, DO, Newark, NJ; John Stein, DO, Newark, NJ; Chan W. Park, MD, Newark, NJ; Soly Baredes, MD, Newark, NJ; Dylan F. Roden, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to identify what clinical and non-clinical variables are associated with an increased risk of morbidity and mortality in elderly patients who undergo free flap head and neck reconstructions.

Objectives: Free flap reconstruction (FFR) of head and neck cancer extirpative defects are now commonplace and increasingly applied to older individuals. A thorough understanding of preoperative factors which may influence postoperative outcomes is crucial for optimizing care, especially in the advanced age population. **Study Design:** Retrospective review of the ACS-NSQIP database was queried between the years 2005-2017. Current procedural terminology (CPT) codes were utilized to isolate FFR cases. Patients older than 70 years (70+) were included. **Methods:** Univariate and multivariate logistic regression analyses were performed to determine predictors of postoperative morbidity, return to OR, prolonged postoperative stay (>10 days), and 30 day mortality. **Results:** 2,837 FFR cases were identified, of which 594 (20.9%) were 70+. Rates of complications were 35.8% (surgical), 15.6% (medical), and 41.4% (overall). The most common complications included excessive bleeding (27.5%) and ventilator use (6.5%). 30 day mortality was 2.6%. Recent prior operation and dependent functional status were both highly associated with mortality (OR: 23.16, OR 10.16). Prolonged operative time (upper quartile, >586 minutes) was associated with prolonged stay (OR: 2.64) and overall (OR: 1.78), surgical (OR: 1.51), and medical (OR: 2.02) complications ($p<0.05$). Blood transfusion was associated with 30 day mortality (OR: 5.77), return to OR (OR: 2.77), and prolonged stay (OR: 2.28). Bleeding disorder was associated with overall (OR: 3.10) and surgical (OR: 2.66) complications. Female gender and smoking were both significant for prolonged stay (OR: 1.85,1.89). **Conclusions:** Complications are common (41.4%) and 30 day mortality in older adult patients undergoing FFR is 2.6%. Mortality risk is significantly elevated in those of dependent functional status and those who recently underwent surgery. Careful consideration of FFR in this patient population is warranted.

60. Blood Transfusion Risk Based on Preoperative Hematocrit in Osteocutaneous Free Flaps of the Head and Neck

Liam Sean Flanagan, BS, Newark, NJ; Chris B. Choi, BS, Newark, NJ; Aksha Parray, BA, Newark, NJ; Aakash Shah, BS, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to investigate and discuss the importance of preoperative hematocrit as it relates to blood transfusion risk in osteocutaneous free flap surgery.

Objectives: Anemia requiring perioperative transfusion is one of the most common complications following free flap procedures, making identification of risk factors for anemia a priority. This study investigates the impact of preoperative anemia on the risk for transfusions in patients undergoing head and neck osteocutaneous free flap procedures. **Study Design:** Retrospective database review. **Methods:** The National Surgical Quality Improvement Program was used to identify patients undergoing osteocutaneous free flap reconstruction of the head and neck between 2005 and 2015. Chi square and multivariate regression analyses were performed to investigate the effect of low preoperative hematocrit on postoperative complications. **Results:** 467 patients were identified. The mean patient age was 59.4 years (range, 21-88). On univariate analysis, low preoperative hematocrit was found in over half of the patients (52.2%). Preoperative anemia was associated with male gender (80.3% vs. 51.1%), diabetes mellitus (13.9% vs. 7.2%), open wounds (11.5% vs. 5.8%), steroid use (4.9% vs. 1.3%), history of weight loss (12.7% vs. 3.6%), chemotherapy (10.0% vs. 1.3%), and decreased functional status (3.3% vs. 0.0%). On multivariate analysis, preoperative low hematocrit was significantly associated with an increased risk for perioperative blood transfusions (OR 3.797, 95% CI 2.401-6.003, $p<0.001$) after adjusting for platelet count and INR. **Conclusions:** Low preoperative hematocrit is associated with an increased risk of perioperative transfusion in patients undergoing osteocutaneous free flap procedures of the head and neck. Given the large proportion of patients with low hematocrit in this population, surgeons should address this risk prior to surgery.

61. Timing of Oral Surgery Consultation and Adjuvant Radiation Initiation in Patients with Squamous Cell Carcinoma of the Oral Cavity/Oropharynx

Rohan S. Ganti, MS MPH, Philadelphia, PA; Josh Mease, BS, Philadelphia, PA; Meghan Crippen, MD, Philadelphia, PA; Vivian Xu, BA, Philadelphia, PA; Voichita Bar-Ad, MD, Philadelphia, PA; David Cognetti, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that in patients with OP/OC SCC, oral surgery evaluation prior to surgical resection is crucial in initiating prompt radiation and avoiding delays.

Objectives: In patients with squamous cell carcinoma (SCC) of the oral cavity (OC)/oropharynx (OP) managed with surgery and adjuvant radiation (RT), delay in the initiation of RT postoperatively has been shown to decrease treatment efficacy. We sought to evaluate the impact of oral surgery evaluation prior to surgical resection on the timing of adjuvant radiation initiation. **Study Design:** Retrospective cohort study. **Methods:** All patients with OC/OP SCC undergoing primary management with surgery and adjuvant RT at our institution between 6/20/16 and 5/29/20 were assessed for inclusion. Patients who were evaluated by oral surgery prior to undergoing tumor resection were identified and grouped for comparison to those who were evaluated after surgery. Groups were assessed for demographic variables including age, sex, and race, and compared for number of days between surgical resection and initiation of adjuvant radiation. Significance was assessed using chi square and independent sample t-test. **Results:** Of the 195 patients meeting inclusion criteria, 52 (26.7%) underwent oral surgery evaluation prior to tumor resection and 143 (73.3%) were seen after tumor resection. No significant differences in demographics were identified between groups. Patients who were seen by oral surgery prior to surgical resection had a significantly shorter mean time to initiation of postoperative radiation (38.8 vs. 49.7 days, $p<0.001$). **Conclusions:** In patients with OP/OC SCC, oral surgery evaluation for tooth extractions prior to surgical resection may facilitate prompt initiation of adjuvant radiation in the postoperative setting.

62. Marginal Zone Lymphoma of Mucosa Associated Lymphoid Tissue of the Salivary Glands: Characteristics of Treatment and Survival

Jeff Gao, BS, Newark, NJ; Christopher C. Tseng, BS, Newark, NJ; Gregory L. Barinsky, PharmD, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Richard C. Park, MD, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to describe patient, clinicopathologic, and treatment variables that impact the survival of patients with marginal zone lymphoma of mucosa associated lymphoid tissue of the salivary glands.

Objectives: To investigate the impact of patient, clinicopathologic, and treatment factors on the survival of patients with marginal zone lymphoma of mucosa associated lymphoid tissue (MALT lymphoma) of the salivary glands. **Study Design:** Retrospective database review. **Methods:** The National Cancer Database (NCDB) was queried for all patients with salivary gland MALT lymphoma between 2004-2016 (2082 cases). Univariate and multivariate analyses were used to examine patient demographics, tumor characteristics and survival. **Results:** Most patients with salivary gland MALT lymphoma were older than 60 years old (56.1%), female (72.8%), white (86.6%), and had a primary site in the parotid gland (84.9%). The most common treatment modality was surgery alone (31.8%). Five year overall survival (OS) was 86.7% and median survival was 12.6 years. Surgery with radiotherapy had the highest five year OS (92.6%) among treatment modalities. Accounting for other patient demographics and clinicopathologic characteristics, patients older than 60 years (HR 3.06, $p<0.001$) and patients with government insurance (HR 2.25, $p=0.001$) had higher mortality. Female patients (HR 0.63, $p=0.017$) and patients treated at academic/research programs (HR 0.58, $p=0.013$) had significantly better survival. Compared to surgery alone, there was no significant difference in survival of patients treated with radiotherapy alone, chemotherapy alone, and all multimodal regimens. **Conclusions:** Patients with salivary gland MALT lymphoma have relatively good OS. Age older than 60 and government insurance are associated with worse prognosis. Female gender and receiving treatment at academic/research programs are associated with improved survival. There was no significant survival advantage found for any particular treatment modality.

63. Synchronous Primary Oncocytoma and Oncocytic Carcinoma of the Parotid Gland with Birt-Hogg-Dubė Syndrome

Julie Yeji Hwang, BA, Spokane, WA; Zain Hasan Rizvi, MD, Seattle, WA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the presentation, imaging findings, relevant associations, and limitations of a novel case of synchronous oncocytoma and oncocytic carcinoma of the parotid gland as well as the association with Birt-Hogg-Dubė syndrome.

Objectives: To present the clinical manifestation, imaging findings, and management of a novel case of a synchronous oncocytoma and oncocytic carcinoma of the parotid gland. **Study Design:** Case report. **Methods:** Reviewed medical records of a patient with synchronous oncocytoma and oncocytic carcinoma of the parotid gland. Relevant publications retrieved using PubMed and Clinical Key databases. **Results:** A 69 year old male presented with a steadily growing, pulsatile, mobile right parotid mass measuring 4 cm in size with overlying violaceous skin changes. Computerized tomography, magnetic resonance imaging, and ultrasound demonstrated vascular pathology, suggestive of arteriovenous

malformation. The patient underwent presurgical embolization, right total parotidectomy with submental island, and cervicofacial advancement flap reconstruction. Following postoperative pathology, demonstrating synchronous oncocytoma and oncocytic carcinoma, the patient underwent selective neck dissection and adjuvant radiation therapy. The constellation of clinical manifestations as well as postoperative workup led to a presumptive diagnosis of Birt-Hogg-Dubė syndrome. **Conclusions:** This case is the first to describe synchronous oncocytoma and oncocytic carcinoma of the parotid gland to our knowledge and supports the existing associations with Birt-Hogg-Dubė syndrome. A review of the literature demonstrated challenges to preoperatively distinguish synchronous multiple parotid tumors from similarly presenting lesions, such as solitary oncocytic lesions and vascular malformations. There may be an association between Birt-Hogg-Dubė syndrome and oncocytoma development suggesting a relationship between an altered FLCN gene and mtDNA dysfunction, though further molecular studies are needed. This case uniquely identifies synchronous oncocytoma and oncocytic carcinoma, the difficulty in preoperative diagnosis, and highlights the association with Birt-Hogg-Dubė syndrome.

64. Pediatric Suprasellar Primary Mixed Non-Germinomatous Germ Cell Tumor: Case Report

Nabil Zaman Khan, BS, Brooklyn, NY; Katherine Liu, BS, New York, NY; Sen Ninan, BS, Brooklyn, NY; Alfred Marc Calo Iloreta, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss and have a greater understanding of the rarity of pediatric primary suprasellar non-germinomatous germ cell tumors and the various potential complications and treatment options.

Objectives: Mixed suprasellar non-germinomatous germ cell tumors (NGGCT) are an extremely rare subset of pediatric intracranial tumors. We present a unique case of a young female with a mixed suprasellar NGGCT with a complicated treatment course. **Study Design:** Case report and review of literature. **Methods:** Case report and review of literature. **Results:** A 9 year old female with no past medical history presented with progressive visual loss, a one month history of memory changes, morning headaches associated with vomiting, central diabetes insipidus, hypothyroidism and adrenal insufficiency. After workup, she was diagnosed with a suprasellar mixed NGGCT based on imaging, histopathology, and elevated beta human chorionic gonadotropin (bhCG) and alpha fetoprotein (AFP) in her serum and CSF. After undergoing 6 cycles of neoadjuvant chemotherapy, the patient's vision improved and MRI demonstrated reduction in tumor volume, but with substantial residual disease. Due to the onset of Covid-19, surgery was delayed and a 7th round of chemotherapy was conducted. Followup surgery involved transsphenoidal endoscopic resection and right craniotomy for further tumor debulking. The patient's postoperative course was complicated by dural sinus venous thrombosis, frontal intracranial hemorrhage, CSF leak, pneumocephalus and deep vein thrombosis (DVT). The patient was eventually stabilized and discharged to a rehab center with plans for radiation. **Conclusions:** Due to rarity of pathology, there is limited literature describing treatment for pediatric suprasellar mixed NGGCTs. Furthermore, little is known regarding the risk of treatment related thromboembolic complications in pediatric intracranial tumors, particularly in patients undergoing chemotherapy. Disease prognosis, appropriate treatment, and predisposing factors to complications remain to be more clearly understood.

65. Fourth Branchial Cleft Cyst: Case Series and Review of the Literature

Monica Kirollos, BS, Scottsdale, AZ; Yassmeen Abdel-Aty, MD, Phoenix, AZ; Navid Prasad, MD, Washington, DC; Michael L. Hinni, MD, Phoenix, AZ; Brittany E. Howard, MD, Phoenix, AZ

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) gain familiarity with congenital branchial cleft anomalies; 2) appropriately identify branchial cleft cyst anomalies to avoid insufficient treatment and recurrence; 3) gain an understanding of the literature regarding fourth branchial cleft cysts; and 4) understand the definitive treatment for these anomalies as presented in this case series.

Objectives: 1) Appropriately identify branchial cleft cyst anomalies to avoid insufficient treatment and recurrence; 2) review the literature regarding fourth branchial cleft cysts; and 3) present a case series to evaluate definitive treatment. **Study Design:** A multi-institutional retrospective study was designed to identify patients with fourth branchial anomalies warranting surgical intervention and their treatment courses were documented. The literature was also reviewed. **Methods:** Advanced text explorer (ATE) was used to identify patients who meet inclusion and exclusion criteria. The terms used were “fourth branchial cyst”, “branchial cyst congenital anomaly”, “fourth branchial cleft”, “congenital neck mass”, “branchial pouch”, “branchial complex anomaly”, “piriform sinus fistula”, and “branchial cleft anomaly”. Data and surgical images were extracted from individual charts, deanonymized, and analyzed. **Results:** Nine patients met inclusion and exclusion criteria with an average age 29.1 years at initial presentation. Eight patients were female. The majority self-identified as white. Patients had 2.4 procedures on average prior to definitive surgical resection. At time of definitive surgical resection, common associated procedures were direct laryngoscopy to identify the possible sinus tract/fistula in the piriform sinus in 8/9 (88.9%) patients and hemithyroidectomy in 3/9 (33.3%). All patients (100%) had successful control of their recurrent infections following the surgical repair with mean of 36.5 weeks postoperative followup. **Conclusions:** Failure to appropriately recognize these anomalies may result in misdiagnosis, insufficient treatment, and continued recurrence. It is our recommendation that fourth

branchial cleft cysts be treated with direct laryngoscopy for identification of sinus tract and open neck surgery with complete excision.

66. Comparing the Efficacy of Virtual and In Person Head and Neck Physical Examination Training on Student Physical Examination Skills Confidence Levels

Matthew Ern Lin, BS, Los Angeles, CA; Khush Kharidia, BS, Los Angeles, CA; Erik Bjorn Vanstrum, BA, Los Angeles, CA; Franklin Mengyuan Wu, BA, Los Angeles, CA; Jonathan West, BS, Los Angeles, CA; Michael Johns, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to evaluate the benefits and limitations of teaching head and neck physical examination (PE) skills through an online platform.

Objectives: To examine the impact of a virtual head and neck PE training on medical students' confidence in performing head and neck examinations and develop a practical guide on implementing online PE trainings. **Study Design:** Retrospective cohort study. **Methods:** We will analyze quantitative data collected from a survey of medical students who received synchronous teletraining to learn head and neck PE skills. We will compare this data with surveys from a skills matched cohort who learned the same content through an in person training session and a nonparticipatory control group. Primary outcomes include students' self-reported confidence levels in performing PEs and knowledge of head and neck cancer risk factors and symptoms. **Results:** Regression analysis will be performed to determine the educational impact of participating in an online training session relative to an in person training. Knowledge of risk factors and symptoms will be analyzed using descriptive statistics. This study is currently underway. Results are pending and will be collated prior to the meeting. **Conclusions:** Based on our results, we will be able to determine whether or not participation in an online head and neck PE training effectively increases student awareness of HNC risk factors and improves confidence in performing head and neck examinations. We hope to inform medical schools and otolaryngologists on what techniques are best suited to medical student education on head and neck PE skills during the Covid-19 pandemic and beyond.

67. Association between Insurance Type and Outcomes in Patients Undergoing Reconstructive Head and Neck Cancer Surgery

Derek H. Liu, BS, Los Angeles, CA; Alison Yu, MD, Los Angeles, CA; Li Ding, MD MPH, Los Angeles, CA; Mark Swanson, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the potential impact of different insurance types, including private insurance, Medicare, and Medicaid, on patients undergoing major oncological and reconstructive surgery.

Objectives: Although the benefits of expanding coverage are clear, there are few studies comparing the different types of insurance. This study aims to determine the association between insurance type and outcomes in patients with head and neck cancer undergoing reconstructive surgery. **Study Design:** Population based cross-sectional study. **Methods:** We identified 1,314 patients from the 2012-2014 Nationwide Inpatient Sample with head and neck cancers undergoing tumor ablative surgery followed by pedicled or free flap reconstruction of oncologic defects. Insurance types were classified as private, Medicare, Medicaid, self-pay, or other. The primary outcome was extended length of stay (LOS), defined as greater than 14 days, which represented the 75th percentile of the study sample. Other preliminary outcomes included acute medical complication, such as pneumonia or sepsis. Multivariate analyses were adjusted for gender, geographic location, and various medical comorbidities. **Results:** In univariate analysis, insurance type was associated with extended LOS ($p = 0.004$) and medical complications ($p = 0.022$). After controlling for other covariates in the multivariate analysis, compared to private insurance, Medicare and Medicaid were both associated with significantly higher odds of extended LOS (adjusted OR [95% CI] 1.51 [1.01-2.25] and 2.08 [1.28-3.38], respectively). However, Medicare and Medicaid were not associated with significantly higher odds of medical complications (adjusted OR [95% CI] 1.06 [0.63-1.79] and 1.72 [0.94-3.15], respectively). **Conclusions:** Compared to private insurance, patients with Medicaid and Medicare were associated with extended LOS but not with acute medical complications. One possible explanation is discharge delay associated with these insurance types. Additional outcomes will include surgical complications, cost, and mortality.

68. Relationship of Dental Care and Early Diagnosis of Head and Neck Cancers

Shreya Mathur, BA, Los Angeles, CA; Albert Han, MD PhD, Los Angeles, CA; George Sankar, BA, Atlanta, GA; Maie St. John, MD PhD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize key socioeconomic risk factors particularly related to dental care that contribute to advanced stage diagnosis of head and neck cancers and worse overall survival.

Objectives: To determine the relationship of access to dental care and diagnosis of head and neck cancers in a large, population level study. **Study Design:** Retrospective cohort study using national and state databases. **Methods:** The Surveillance, Epidemiology, and End Results database was utilized to identify head and neck cancer patients between 2003-2015. This data was linked with aggregate county level dental information from the California Health Interview Survey. Multivariate logistic regression was performed to identify risk factors for late stage (stage III/IV) presentation. Multivariate Cox regression survival analyses were used to identify significant covariates for overall survival. **Results:** In a cohort of 51,732 patients, patients living in areas with sparse dental coverage and a greater than six month gap since a dentist visit were significantly more likely to be diagnosed with later stage oral cavity cancer. Moreover, patients with oral cavity cancer in counties with higher dental problem related recent visits had worse overall survival. Interestingly, dental problem related recent dental visits were also associated with later stage laryngeal cancer, and poor dentition was associated with worse overall survival for oropharyngeal cancer. Age and male sex were associated with higher risk of advanced stage diagnosis for all head and neck cancers. **Conclusions:** Dental care and oral hygiene have a significant impact on the stage at presentation and overall survival of oral cavity, oropharyngeal, and laryngeal cancers. Herein we present a risk model of advanced stage diagnosis of oral cavity cancer that includes possession of dental insurance and regular dentist visits.

69. The Role of Multimodal Therapy for Metastatic Head and Neck Squamous Cell Carcinoma

Ghayoour Mir, DO, Newark, NJ; Samer T. Elsamna, BA, Newark, NJ; Richard Chan Woo Park, MD, Newark, NJ; Soly Baredes, MD, Newark, NJ; Dylan F. Roden, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the role different systemic therapies including immunotherapy, chemotherapy, and radiation have in treating metastatic head and neck squamous cell carcinoma.

Objectives: Head and neck squamous cell carcinoma (HNSCC) with distant metastasis at initial presentation poses a treatment dilemma. The intent of treatment is often palliative rather than curative, and some advocate for less aggressive treatment in order to avoid toxicities. There is limited data to help select the appropriate amount of treatment in HNSCC patients presenting with metastatic disease. **Study Design:** Retrospective study of a national cancer registry. **Methods:** The National Cancer Database (NCDB) was queried for cases of HNSCC with metastasis from the years 2013-2015. Kaplan-Meier analysis and log rank test were used to compare survival. The impact that treatment and clinicopathologic variables have on survival was assessed using multivariate Cox regression analysis. **Results:** A total 3173 cases were selected. Most cases were aged >60 (60.4%), male (79.9%), white (79.7%), T-stage 4 (40.9%), and N-stage 2 (61.5%). Overall 1 year survival was 41.3%. The greatest 1 year survival was observed with chemoradiation+immunotherapy (56.6%) and chemoradiation (59.2%). The 1 year survival rate for chemotherapy alone was significantly higher than radiation alone (39% vs 23%, $p<0.05$) and significantly lower than chemoradiation (53%, $p<0.05$). **Conclusions:** HNSCC with distant metastasis has a poor prognosis. Multimodal treatment demonstrated improved survival compared to unimodal treatment. Database outcomes regarding immunotherapy are immature. Future research should explore additional combinations of treatment for metastatic HNSCC.

70. Salivary Gland Epithelial-Myoepithelial Carcinoma: A Hospital Based Survival Analysis

Neal Panse, MPH, Newark, NJ; Dongmin C. Kim, Newark, NJ; Gregory L. Barinsky, PharmD, Newark, NJ; Jordon G. Grube, DO, Newark, NJ; Dylan F. Roden, MD MPH, Newark, NJ; Richard C. Park, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants will be able to recognize the impact of demographics, clinicopathologic characteristics, and treatment modality on overall survival of epithelial-myoepithelial carcinoma of the major salivary glands.

Objectives: Epithelial-myoepithelial carcinoma (EMC) is a rare tumor of the salivary glands (SG-EMC). The aim of this study is to examine the patient demographics, clinicopathologic characteristics, and treatment factors that impact survival of patients with EMC in the United States. **Study Design:** Retrospective study of the National Cancer Database (NCDB). **Methods:** The 2004-2016 NCDB was queried for SG-EMC. Factors such as age, race, sex, stage, and treatment modality were analyzed. Overall survival (OS) was analyzed with Kaplan-Meier and Cox proportional hazard analysis. **Results:** 654 cases of SG-EMC were identified, of which the most common site was the parotid gland (84.9%). The majority of patients were aged 60 and over (63.9%), female (56.7%), and white (81.3%) Clinical T stage distribution was T1 (37.9%), T2 (38.1%), T3 (17.0%), and T4 (7.0%). Almost all patients were cN0 (95.8%). Most patients had surgery alone (51.8%), followed by surgery plus radiotherapy (RT) (29.9%), and RT alone (9.6%). Five-year OS was 87.1% for surgery alone, 80.5% for surgery plus RT, and 58.3% with no treatment. Cox regression demonstrated a significantly higher hazard of death for Black race (HR 3.987, $p=0.004$) and age greater than 80 (HR 6.261, $p=0.008$). Gender, stage, and tumor size were not found to have a significant effect on OS. Compared to surgery alone, surgery plus RT (HR 1.517, $p=0.322$) did not significantly affect survival. **Conclusions:** SG-EMC has a favorable 5 year OS. Treatment with radiotherapy may offer no survival benefit while age at diagnosis and race may impact survival the greatest. Tumor stage does not impact survival.

71. Analysis of Treatment Factors and Survival of Laryngeal Neuroendocrine Carcinoma, 2004-2016

Nil D. Rawal, BA, Newark, NJ; Mohammad A. Hossain, BS, Newark, NJ; Gregory L. Barinsky, PharmD, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Wayne D. Hsueh, MD, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants will be able to identify trends in demographics, significant prognostic factors, and treatment modalities that improve survival in laryngeal neuroendocrine carcinoma.

Objectives: Laryngeal neuroendocrine carcinoma (LNEC) is a rare but aggressive malignancy that represents the most common nonsquamous laryngeal neoplasm. The goal of this study is to analyze the demographics and survival of patients with LNEC. **Study Design:** Retrospective cohort study of a hospital based tumor registry. **Methods:** The National Cancer Database was used to extract cases of LNEC diagnosed from 2004-2016. Survival analysis was conducted using Kaplan-Meier and Cox proportional hazards analysis. **Results:** A total of 1154 LNEC cases were identified. The majority of patients were male (62.2%) and white (85.1%). The mean age of diagnosis was 62.3 years. Most tumors were small cell carcinoma histologic subtype (51.0%), grade III (50.1%), stage IV (61.3%), and located in the supraglottis (58.2%). The 5 year overall survival (5Y-OS) for the entire cohort was 25.4%, and median (range) survival was 1.6 (0-13.1) years. Surgery plus radiotherapy had the highest 5Y-OS (51.4%), followed by surgery alone (43.6%). Multivariate regression showed that supraglottic tumors had better survival than glottic (HR=1.419, p=0.044) and subglottic (HR=1.452, p=0.038) tumors. Female gender had significantly better survival (HR=0.609, p<0.001). Surgery and radiotherapy (RT) (HR=0.211, p<0.001), surgery and chemoradiotherapy (CRT) (HR=0.282, p<0.001), and CRT alone (HR=0.241, p<0.001) had significant survival benefit compared to surgery and chemotherapy. Poor prognostic factors included grade III or IV tumors (HR=3.247, p<0.001) and stage III or IV (HR=3.026, p<0.001) disease. **Conclusions:** Supraglottic location and female gender may confer survival benefit in patients with LNEC. Surgery and RT, surgery and CRT, and CRT alone were associated with improved survival.

72. Effect of Free Flap Monitoring Modalities on Flap Salvage and Survival Rate: A Systematic Review and Meta-Analysis

Emily S. Sagalow, BS, Philadelphia, PA; Ramez Philips, MD, Philadelphia, PA; Larissa Sweeny, MD, Baton Rouge, LA; Mark Wax, MD, Portland, OR; Adam Luginbuhl, MD, Philadelphia, PA; Joseph Curry, MD, Philadelphia, PA

Educational Objective: To understand the effect of different free flap monitoring techniques on flap salvage and survival.

Objectives: This study aims to compare flap survival and salvage rate between either implantable Doppler, near infrared spectroscopy (NIRS), or microdialysis and conventional clinical exam. **Study Design:** Systematic review and meta-analysis. **Methods:** Medline, Google Scholar, and Cochrane databases were queried. Included studies compared flap survival and salvage rate between either implanted Doppler, microdialysis, and/or NIRS with clinical monitoring with or without external doppler. Studies that compared modalities within one flap were excluded. A forest plot was plotted via inverse variance weighting, random effects model, and odds ratio for effect size. **Results:** The search yielded 15 articles that met all inclusion criteria. A total of 6,619 patients were included in the analysis. Implantable Doppler was associated with significantly higher flap salvage rate but similar overall flap survival rates when compared to conventional methods (9 studies, p=0.003 and p=0.32, respectively). When compared to flap monitoring with external Doppler, implantable Doppler was associated with significantly higher flap salvage and overall survival rates (4 studies, p=0.04 and p=0.02, respectively). NIRS was associated with higher significantly higher flap salvage and overall survival rates when compared to conventional methods (4 studies, p=0.003, p=0.01, respectively). Microdialysis did not differ from conventional methods in terms of flap salvage and overall survival (2 studies, p=0.48 and p=0.27, respectively). **Conclusions:** These findings suggest implanted Dopplers and NIRS are favorable flap monitoring modalities compared to conventional methods.

73. Socioeconomic Disparities in Head and Neck Cancer Stage at Presentation and Survival

George B. Sankar, BS, Atlanta, GA; Albert Y. Han, MD PhD, Los Angeles, CA; Maie A. St. John, MD PhD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the impact of socioeconomic status and health behavior on head and neck cancer.

Objectives: To characterize socioeconomic status (SES) of patients who were diagnosed with head and neck cancer (HNC) using the Surveillance, Epidemiology, and End Result (SEER) database and California Health Interview Survey (CHIS).

Study Design: Retrospective cohort study using a national database and a state database. **Methods:** The SEER registry and CHIS database were utilized to obtain clinical and county level SES of HNC patients between 2011-2015. Patient data was then analyzed to determine predictors of advanced stage diagnosis and survival. **Results:** A total of 19085 cases of HNC were included. Patients were predominantly in their 60s, male, and white. Multivariate analyses revealed that the age at diagnosis, sex, race, primary tumor site, county poverty level, and county obesity levels were all significant predictors of stage at presentation. Univariate cox proportional hazard regression also demonstrated that poverty and obesity were also predictors of poorer survival. However, when controlled for overall county level health status and physical activity level, these were no longer significant in multivariable analyses. **Conclusions:** Advanced stage at diagnosis was associated with age, sex, race, tumor site and county poverty and obesity rates. However, poverty and obesity were not significant prognosticators for survival when controlled for overall health and physical activity, suggesting a complex relationship between SES and health. Our study underlines the urgent need for improved cancer screening especially in medically underserved areas.

74. Evaluating 30 Day Emergency Room Visits and Readmissions after Glossectomy for Oral Tongue Squamous Cell Carcinoma

Iram Shafqat, BS, Los Angeles, CA; Albert Y. Han, MD PhD, Los Angeles, CA; Alden F. Smith, MD, Los Angeles, CA; Jason Qian, BS, Los Angeles, CA; Maie A. St. John, MD PhD, Los Angeles, CA; Dinesh K. Chhetri, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the risk factors for 30 day emergency department (ED) visits and readmissions after partial or total glossectomy performed for resection of oral tongue squamous cell carcinoma.

Objectives: To determine the 30 day ED visits and unplanned readmissions following glossectomy for oral tongue squamous cell carcinoma and their impact on patient outcome and survival. **Study Design:** Single institution retrospective, cohort study. **Methods:** All patients who underwent a glossectomy procedure for oral tongue squamous cell carcinoma at a tertiary academic medical center between January 2013 - December 2019 were included. Patients who visited the ED or were readmitted in the 30 days following surgery were identified. The clinicopathologic characteristics were analyzed to identify an at risk population. Kaplan-Meier analysis was performed to assess the impact of readmission on overall survival. **Results:** Of the 395 patients included, 32 (8.1%) returned to the ED, and 26 (6.6%) had an unplanned readmission within 30 days after surgery. Patients with a T4 stage tumor were the most likely to return to the ER ($p = 0.01$) and to have an unplanned readmission ($p = 0.03$) versus patients with lower T stages. Unplanned readmission was a poor prognostic factor with worse overall survival ($p=0.006$). Wound related complications (infection, dehiscence, or fistula formation) comprised 38.5% of all unplanned readmissions. **Conclusions:** A small minority of patients returned to the ED or were readmitted, most commonly due to wound related complications. Patients with advanced T stage more frequently returned to the ED and readmitted for an unplanned postoperative complication. Patients requiring readmission within 30 days postoperatively had poorer overall survival. A close surveillance of at risk populations after glossectomy is needed to improve patient survival.

75. Ultrasound Detection of Sialoliths: A Systematic Review

Jacob Charles Shalkevich, BS, Washington, DC; Christopher Badger, MD, Washington, DC; Juan Nogues, BS, Washington, DC; Alexander Straughan, BS, Washington, DC; Arjun Joshi, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the different perspectives within the literature surrounding ultrasound as a diagnostic technique for sialolithiasis. They will leave with the information needed to consider utilizing ultrasound as a method within their own clinics as opposed to computed tomography, magnetic resonance imaging, or x-ray sialography, and with a general knowledge of the benefits and downsides to each technique.

Objectives: Perform a systematic review of the diagnostic accuracy of ultrasound (US) for the detection of sialoliths. **Study Design:** Systematic review. **Methods:** A search was conducted using PubMed, Google Scholar, Cinahl/Ebsco, and Scopus using PRISMA guidelines. A total of 287 papers were found on the initial screen. Due to heterogeneity, we narratively synthesized the evidence. **Results:** Eleven studies met inclusion criteria, representing 2,906 salivary glands between the years 1991 and 2019. Overall, US sensitivity and specificity ranged from 65.1% to 96.6% and 66.7% to 98.1% respectively. Otolaryngologist performed US demonstrated the highest sensitivity of 96.6%. The lowest sensitivity reported of 65.1%, was seen when ultrasound was performed in community radiology departments, however, the highest specificity of 98.1% was also seen in this setting. Of the five highest reported sensitivities--all of which above 90%--four were conducted in otolaryngology clinics. Of the six lowest reported sensitivities, four took place in radiology departments. When performers in both settings used transoral US or sonopalpation to assist in detection, sensitivity rose to a range of 94.74% to 96.6%. **Conclusions:** There is some debate regarding the preferred imaging modality for the initial diagnosis of sialolithiasis.

Otolaryngologist performed ultrasound is a very sensitive technique for the detection of suspected sialoliths. When supplemented by sonopalpation or a transoral US transducer, both otolaryngologist and radiology technician performed ultrasound appear both sensitive and specific for the detection of sialolithiasis.

76. Utilization of Soluble CD44 and Total Protein in Oral Rinses for Detection of Cancer

Drew Hayes Smith, MD MS, Miami, FL; Isildinha M. Reis, PhD, Miami, FL; Huaping Liu, MD, Miami, FL; Jerri Halgowich, BS, Miami, FL; Claudia Gordon, AS, Miami, FL; Elizabeth J. Franzmann, MD, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how soluble CD44 and total protein levels in oral rinses could be used as a potential tool to aid in detection of oral and other types of cancer.

Objectives: Levels of soluble CD44 (solCD44) and total protein (TP) in oral rinses are effective correlates for oral cancer. We demonstrate whether they could also be associated with other types of cancer. **Study Design:** Case control. **Methods:** 150 human subjects were enrolled from a head and neck clinic in 2011. Oral rinses were collected and levels of solCD44 (ELISA assay) and TP (DC protein assay) were measured at baseline and during 4 subsequent years. Incidence of any cancer was determined. Published risk group cutoffs were used for determining levels of solCD44 and TP (low risk = solCD44 <2.22 ng/mL and TP <1.23 mg/mL. High risk = solCD44 <2.22 ng/mL and TP ГëÑ1.23 mg/mL; or solCD44 ГëÑ2.22 and <5.33 ng/mL and TP <0.558 mg/mL; or solCD44 ГëÑ2.22 and <5.33 ng/mL and TP ГëÑ0.558 mg/mL; or solCD44 ГëÑ5.33 ng/mL, regardless of TP level). Association between solCD44/TP levels and incidence of cancer was calculated. **Results:** 101 patients remained in the study for sufficient evaluation. 11 patients developed cancer or suspected cancer through July 2020. Of these 11 cases, 9 had high risk solCD44 and TP levels. Within the 90 patients in the cancer free control cohort, 41 had high risk levels. Chi square analysis resulted in a p value of 0.01 and an odds ratio of 5.38. **Conclusions:** Patients with high risk levels of solCD44 and TP in oral rinses are 5.38 times more likely to develop cancer than those with low risk levels. Measuring this data from a simple oral rinse could help clinicians identify patients at risk for cancer.

77. Predictors of Survival in Salivary Gland Malignant Mixed Tumor not Otherwise Specified: A Population Based Analysis

Justin M. Soffer, Boston, MA; Samih J. Nassif Abudinen, MD, Boston, MA; Michael W. Von Plato, MD, Torrance, CA; Jaime Chisholm, MBA, Boston, MA; Miriam A. O'Leary, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the demographic, tumor, and survival characteristics as well as predictors of increased mortality in patients with this rare salivary gland malignancy.

Objectives: Malignant mixed tumor not otherwise specified (MMT-NOS) is a rare salivary gland neoplasm with limited evidence regarding management strategies and has yet to be characterized by population level analysis. The objective was to summarize the clinicopathologic features and survival of MMT-NOS. **Study Design:** Retrospective database review. **Methods:** The Surveillance, Epidemiology, and End Results (SEER) database was queried for relevant demographic, tumor, and survival variables in major salivary gland MMT-NOS cases from 1973 to 2016. 5 year overall and disease specific survival (OS, DSS) were calculated. Cox proportional hazards model and Kaplan-Meier curves were employed to identify independent prognostic factors and calculate hazard ratios (HR). **Results:** A total of 434 patients were identified. The median age at diagnosis was 63 years. The majority of neoplasms were high grade and high stage (70.8% grade III-IV, 63.8% stage III-IV). Extraparenchymal extension (40.6%) and lymph node involvement (28.5%) were common; distant metastasis (2.4%) was rare. Treatment included combinations of surgery (93.0%), radiation (51.6%), and chemotherapy (10.4%). Median survival was 118.26 months. 5-year OS and DSS were 65.67% and 82.95%, respectively. In multivariate analysis, N2 nodal status (HR 7.04, p<0.001), extraparenchymal extension (HR 2.50, p4 cm (HR 3.11, p<0.015), and combination surgery-radiation-chemotherapy (HR 6.11, p<0.018) were independent predictors of mortality. **Conclusions:** MMT-NOS is a rare salivary gland tumor with moderate prognosis and uncommon distant metastasis despite high grade and high stage at diagnosis. Nodal status, tumor size, and extraparenchymal extension were significantly associated with lower survival. Further research is needed to elucidate the role of chemotherapy in management of MMT-NOS.

78. Induction Chemotherapy Regimens and Response in Head and Neck Cancer

Anita Sulibhavi, MD, Philadelphia, PA; Grace Amadio, BS, Philadelphia, PA; Jeffrey C. Liu, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify common therapeutic classes used in induction chemotherapy, ways that response to induction chemotherapy is measured, and the gaps in literature requiring further study.

Objectives: Induction chemotherapy (IC) is frequently used as part of treatment in head and neck mucosal squamous cell carcinoma (SCC). We sought to evaluate the most common regimens of IC and response rates to evaluate potential predictors of IC response. **Study Design:** Literature review. **Methods:** A PubMed search of the terms "induction chemotherapy" OR "neoadjuvant chemotherapy", AND "head and neck". This resulted in 2,587 studies. Studies were included if induction regimen included a platinum containing agent, and measured response rate to IC prior to subsequent treatment. Studies were excluded if response rates were not recorded. Only cases of mucosal SCC were included; nasopharynx was excluded. **Results:** Final analysis included 23 studies. Among 2,904 subjects who received IC, 1,865 had a recorded response (64%). Among subjects in studies specifying complete vs. partial response (n=1,695), 30% had complete response while 70% had partial response. Along with a platinum containing agent, most studies included at least one of either 5 fluorouracil or docetaxel (78%); some included cetuximab (17%). Response to induction chemotherapy was evaluated using combinations of RECIST criteria (30%), physical exam (endoscopic and direct laryngoscopic evaluation) (52%), and non-RECIST radiological evaluation (48%). Response to IC was primarily a secondary outcome. Primary outcomes included overall survival, progression free survival, laryngectomy free survival, response rate to chemoradiation at the end of treatment. **Conclusions:** Use of IC in head and neck cancers is broadly reported in the literature. However the measurement of response is varied. Further analysis is needed to determine predictors of IC response.

79. Technical Considerations in Management of the Vascular Pedicle in Midface Free Flap Reconstruction

Brian Swendseid, MD, Philadelphia, PA; Matthew Stewart, BS, Philadelphia, PA; Eric Mastrolonardo, BS, Philadelphia, PA; Larissa Sweeny, MD, New Orleans, LA; Mark K. Wax, MD, Portland, OR; Joseph Curry, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand technical challenges in midfacial reconstruction related to pedicle management. Participants will gain an appreciation for which flap types often require advanced techniques, review an array of available techniques, and understand the flap outcomes for those techniques.

Objectives: Describe outcomes for different management paradigms of the vascular pedicle in mid/upper facial free flap reconstruction. **Study Design:** Retrospective review at three tertiary care institutions. **Methods:** Database review. **Results:** 282 patients underwent free flap reconstruction of the midface (103 bony, 179 soft tissue). Arteries for revascularization were: facial (77%), superficial temporal (8%) and external carotid (6%). The artery required grafting in 2% (4% of bony and 1% of soft tissue). The pedicle vein required grafting in 7% of flaps (21% of fibula, 18% of scapula and 3% of soft tissue). For scapular flaps, the pedicle reached the ipsilateral neck 71%, while 29% were anastomosed to the facial vessels via a separate cheek incision or an intraoral anastomosis. For all non-scapular flaps, anastomosis was performed in the ipsilateral neck. Additional techniques in pedicle management included anastomosis to the angular system intraorally, coronoidectomy to accommodate pedicle orientation, flow through second free flap and parotidectomy in vessel depleted necks. These additional maneuvers were not associated with increased in flap failure rate (4% in this cohort), intraoperative pedicle revision or complications. **Conclusions:** When pedicle length is a concern, vascular grafting, a separate facial incision or additional maneuvers to optimize pedicle orientation may be performed. For fibula reconstruction, vein grafting is often needed. Scapula flaps often require vascular grafting or atypical anastomotic locations. These maneuvers are well tolerated and do not increase complications of failure rates.

80. Characterizing Treatment and Survival for Cervical Esophageal Squamous Cell Carcinoma

Christopher C. Tseng, BS, Newark, NJ; Jeff Gao, BS, Newark, NJ; Gregory L. Barinsky, PharmD, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Jordon G. Grube, DO, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to describe factors that affect the survival of patients with cervical esophagus squamous cell carcinoma.

Objectives: To investigate patient demographics and other factors associated with treatment and survival of patients with cervical esophagus squamous cell carcinoma (CE-SCC). **Study Design:** Retrospective database review. **Methods:** The National Cancer Database (NCDB) was queried for all cases of CE-SCC between 2004-2015 (n=2379). Univariate and multivariate analyses were then performed using Kaplan-Meier and Cox proportional hazards methods to assess patient demographics, tumor characteristics, treatment modalities, and survival. **Results:** Patients with CE-SCC were more likely to be white (77.0%), male (61.4%), and over 60 years old (74.1%). The majority of patients were treated with radiotherapy and chemotherapy (CRT) (57.0%). One year overall survival (OS) for all CE-SCC patients was 53.5%. Those who received

surgery plus CRT had the highest one year OS (79.1%), followed by surgery alone (66.9%), radiotherapy and chemotherapy (65%), chemotherapy alone (35.8%), radiotherapy alone (31.3%), and no treatment (19.6%). Accounting for patient, tumor, and other clinicopathologic characteristics through multivariate analysis, having a Charlson-Deyo score of 1 (HR 1.41, p=0.021) or 2+ (HR 1.71, p=0.048) was significantly associated with decreased survival. Radiotherapy alone trended towards worse survival compared to surgery alone (HR 1.87, p=0.053), and surgery plus CRT trended towards better survival (HR 0.40, p=0.075). **Conclusions:** Having a Charlson-Deyo score greater than 0 was associated with increased mortality in CE-SCC patients. Compared to surgery alone, surgery plus CRT may be associated with some survival benefit while radiotherapy alone may have a poorer prognosis.

81. A Community Based Head and Neck Cancer Screening in an Underserved Hispanic Population

Erik Bjorn Vanstrum, BA, Los Angeles, CA; Franklin Mengyuan Wu, BA, Los Angeles, CA; Khush Kharidia, BS, Los Angeles, CA; Margaret C. Nurimba, MD, Los Angeles, CA; Mark Swanson, MD, Los Angeles, CA; Edie R. Hapner, PhD, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize a need for human papilloma virus (HPV) education in underserved populations and understand the role of head and neck cancer (HNC) screenings in improving community health.

Objectives: To analyze the efficacy of HNC screenings in reporting abnormal findings and evaluating prevalence and knowledge of risk factors for HNC in underserved Hispanic populations. **Study Design:** Retrospective study of data collected from a screening event in January 2020. **Methods:** 61 patients from a community health center participated in a community based HNC screening. All participants were administered a survey in Spanish or English. Surveys providing demographic information and knowledge of HNC risk factors were analyzed. Post-screening data was analyzed to determine incidence of abnormal findings. **Results:** Participants had a mean age of 52.6 years. Most were female (82%), Hispanic (89%), and from low income households (61% <$50,000). 21% were current or former smokers, 22% reported moderate to severe alcohol use, and only 3% claimed to have received the full HPV vaccination series. Half of the participants had never heard about HPV (50%). A majority did not correctly identify alcohol use (73%), HPV (73%), and tobacco use (53%) as risk factors for HNC. 10 participants (16%) were referred for followup for concerning findings. **Conclusions:** Many low income Hispanic females have limited literacy regarding HNC risk factors. Comprehensive education for Hispanic populations on HPV vaccinations, alcohol, and tobacco use could improve health outcomes. Community based screenings are effective in early detection of abnormal findings among vulnerable populations and offer opportunities for educating community members.

82. Long Term Opioid Use in Post-Surgical Management of Head and Neck Cancer

Judy J. Wang, BS MSE, Boston, MA; Samuel J. Rubin, MD MPH, Boston, MA; Anand K. Devaiah, MD, Boston, MA; Daniel L. Faden, MD PhD, Boston, MA; Andrew R. Salama, MD DDS, Boston, MA; Heather A. Edwards, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to gain a better understanding of the prevalence and implications of postoperative opioid use in patients who have undergone primary surgical treatment for head and neck malignancies.

Objectives: This study aims to identify factors associated with long term, post-surgical opioid use in the head and neck cancer population. **Study Design:** Retrospective cohort study. **Methods:** A single center retrospective study was conducted including patients diagnosed with head and neck cancer between January 1, 2014 to July 1, 2019 who underwent primary surgical management. The primary outcome measure was continued opioid use 6 months after date of diagnosis. Both demographic and cancer related variables were recorded to determine what factors were associated with prolonged opioid use. Univariate analysis was performed using chi squared test for categorical variables and multivariate analysis was performed using logistic regression. **Results:** A total of 363 patients received primary surgical management during the study period. 12.67% (n=46) of patients continued to take opioids 6 months after cancer diagnosis, and 6.61% (n=22) of patients who only received surgery continued taking opioids. Using univariate analysis, age less than 65 years (n=37, p=00.91), adjuvant chemoradiation (n=19, p<0.001), and overall length of hospital stay (p=0.0364) were significantly associated with long term opioid use. Multivariate logistic regression shows adjuvant chemoradiation [OR= 2.972 95% CI (1.503, 5.877), p=0.0017], age less than 65 years at time of diagnosis [OR=2.293 95% CI (1.052, 4.996), p=0.0368], and overall length of hospital stay [OR=1.051 95% CI (1.001, 1.102), p=0.0446] to be significantly associated with opioid use 6 months after head and neck cancer diagnosis. **Conclusions:** Long term postoperative opioid use in head and neck cancer patients is significantly associated with age less than 65 years, adjuvant chemoradiation, and patients with longer length of hospital stay, and therefore it would be beneficial to take these factors into account when prescribing opioids for this patient cohort.

83. Emergency Department Visits and Unplanned Hospital Readmissions after Transoral Robotic Surgery for Oropharyngeal Squamous Cell Carcinoma

Brittany M. Wong, BS, Los Angeles, CA; Albert Y. Han, MD PhD, Los Angeles, CA; Alden F. Smith, MD, Los Angeles, CA; S. Christopher Yang, BS, Los Angeles, CA; Maie A. St. John, MD PhD, Los Angeles, CA; Dinesh K. Chhetri, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the rate of and reasons for emergency department (ED) visits or unplanned readmission following transoral robotic surgery (TORS) for oropharyngeal squamous cell carcinoma (OPSCC).

Objectives: Determine the rate and causes of emergency department (ED) visits or unplanned readmission within the first 30 days following transoral robotic surgery (TORS) for oropharyngeal squamous cell carcinoma (OPSCC). **Study Design:** Retrospective case review at a single institution. **Methods:** The clinicopathologic information was reviewed of patients who underwent TORS for OPSCC between January 2013 and July 2020. **Results:** Of 316 patients who met inclusion criteria, 40 (12.7%) presented to the ED and 30 (9.5%) were readmitted. Twenty-seven patients were admitted through the ED, 2 from the outpatient clinic, and 1 from home. Patients presented to the ED an average of 10.9 ± 6.8 days postop and were readmitted an average of 11.8 ± 6.6 days postop. Thirty-three (10.4%) patients presented to the ED or were readmitted because of surgical complications. The most common reason for return was hemorrhage, in 19 patients (57.6%); intervention was warranted in 84.2% (16/19) of these cases. Post-discharge oropharyngeal bleeding occurred on average 10.8 ± 6.7 days after TORS. Overall postoperative hospital return, ED visit, readmission, and hemorrhage did not vary significantly by age, sex, p16 status, primary versus recurrent tumor, TNM stage, neck dissection, adjuvant therapy, smoking status, alcohol consumption, or drug use. **Conclusions:** In a minority of cases, patients are at risk of postoperative complications after TORS. The most common complication was hemorrhage, warranting intervention in over 80% of cases. Further study is warranted to identify specific risk factors and preventative measures to optimize care for these patients.

84. The Educational Impact of Participating in a Community Based Head and Neck Cancer Screening Event on Medical Students

Franklin Mengyuan Wu, BA, Los Angeles, CA; Erik Bjorn Vanstrum, BA, Los Angeles, CA; Matthew Ern Lin, BS, Los Angeles, CA; Jonathan West, BS, Los Angeles, CA; Mark Swanson, MD, Los Angeles, CA; Edie R. Hapner, PhD, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how a head and neck screening can enhance medical student knowledge of oropharyngeal squamous cell carcinoma (OPSCC) and confidence in performing head and neck physical examinations (PEs).

Objectives: Determine the impact of participating in a community based head and neck cancer (HNC) screening on medical students' self-confidence in performing PEs and develop an innovative paradigm for teaching PE skills. **Study Design:** Retrospective cohort study collected at a screening event in January 2020. **Methods:** First year medical students received training on HNC PEs 2 days prior to participating in the HNC screening event. Participants received surveys before the training and 2 weeks after the screening. A non-participatory control group of students was also surveyed. Student confidence levels in performing head and neck PEs were measured by a Likert scale. Student ability to identify risk factors and symptoms of OPSCC was assessed. **Results:** First year medical students were more confident in examining the oral cavity (14.3% vs 50%), cervical lymph nodes (14.3% vs 50%) and thyroid (9.5% vs 25%) after the training. Comfort in using an otoscope (14.3% vs 58.3%) and ability to identify HNC symptoms (66.7% vs 91.7%) also increased. **Conclusions:** Participation in a community based screening is an effective method to both increase medical student awareness of OPSCC risk factors and improve confidence in performing head and neck PEs. Our findings reveal a need for early medical student education on OPSCC risk factors and HNC PE skills.

Laryngology/Bronchoesophagology

85. Phonation Onset Pressure Revisited: Effects of Intrinsic Laryngeal Muscle Activation

Shaghauyegh S. Azar, BS, Los Angeles, CA; Dinesh K. Chhetri, MD FACS, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the ways in which intrinsic laryngeal muscle activation influences the respiratory effort required to achieve phonation.

Objectives: To evaluate the effects of intrinsic laryngeal muscle (ILM) activation, individually and in combination, on phonation threshold pressure (Pth). **Study Design:** Basic science study using an in vivo canine model. **Methods:** A variety of ILM activation conditions were tested individually and in combination in an in vivo canine model of phonation. The thyroarytenoid (TA), lateral cricoarytenoid/interarytenoid (LCA/IA), and cricothyroid (CT) muscles were progressively

activated via stimulation of terminal branches of the laryngeal nerves. Subglottic pressure was increased to phonation onset and beyond. Acoustic output, glottal vibration, and phonatory posture were recorded. **Results:** When all laryngeal adductors (TA/LCA/IA) were activated, Pth increased but the effect of CT activation was minimal. CT activation increased Pth in combination with LCA activation alone but not TA activation alone. LCA/IA and TA activation together were antagonistic to CT effects on Pth. **Conclusions:** Complex interactions of the ILMs on Pth were observed and the effects depended upon the specific sets of muscles activated and their expected effects on stiffness and tension of the vocal folds. Specific combinations of muscle activation should be considered in modeling effects of ILM activation on phonation onset.

86. Analysis of Socioeconomic Determinants in Utilization of Tertiary Laryngology Clinic Resources for the Treatment of Dysphonia

Jonathan M. Bock, MD, Milwaukee, WI; Shane W. White, BS, Milwaukee, WI (Presenter); Joel H. Blumin, MD, Milwaukee, WI; David R. Friedland, MD PhD, Milwaukee, WI; Jazzmyne A. Adams, MPH, Milwaukee, WI; Jake Luo, PhD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should be able to critically evaluate the role that socioeconomic determinants such as race, income, college education, and insurance rate play in tertiary laryngology clinic utilization for the evaluation of dysphonia.

Objectives: To determine the impact of patient demographics and socioeconomic factors on the utilization of tertiary laryngology care services for evaluation of dysphonia in a metropolitan area. **Study Design:** The entire electronic health record of our academic center was interrogated for patient demographics, diagnosis, and clinical provider for a 10 year window between 2009 and 2019. **Methods:** The association between selected determinants of health and tertiary laryngology utilization were assessed by multivariate regression analyses. Laryngology utilization rates were calculated for each regional ZIP code and correlated with census data for median income and education. Patient characteristics (age, gender, race, insurance status) and population level data (median income and education level) from the surrounding counties, health system, and otolaryngology department were compared to utilization of tertiary laryngology services for dysphonia. **Results:** 7,066 patients with a diagnosis of dysphonia used tertiary laryngology services at our institution between 2009-2019 (out of a total of 1,365,021 health system patients). Patients were older (62), more likely to be female (63.7%), and insured (97.9%) when compared to the surrounding population. Adjusted analyses showed insurance, education level, and Black race to be independently associated with tertiary care utilization. Median income alone was not an independent contributing factor in our region. **Conclusions:** Utilization of tertiary laryngology services correlated with insurance, education level, and race, but income was not an independent factor in our region. These results both expand upon previous findings as well as provide new information regarding determinants of access to tertiary laryngology care.

87. Impact of Anxiety and Depression on Voice Handicap Index in Patients with Benign Dysphonia

Kwasi A. Enin, St. Louis, MO; Dorina Kallogjeri, MD MPH, St. Louis, MO; Margaret Huston, MD, St. Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to evaluate differences in initial Vocal Handicap Index10 scores between patients with anxiety or depression and those without.

Objectives: Mental health conditions such as anxiety and depression have demonstrated positive correlation with vocal impairment among patients with benign causes of dysphonia. Our objective is to evaluate differences in initial Vocal Handicap Index 10 scores between patients with anxiety or depression and those without. **Study Design:** Retrospective chart review. **Methods:** A retrospective review of patients presenting with dysphonia to a tertiary, laryngology clinic was performed. Demographics, diagnosis, and results of patient reported outcome measures were collected. Causes of benign dysphonia were categorized as abnormal laryngeal mechanics (ALM), vocal fold lesions, glottal insufficiencies/motion abnormalities, or other. Independent sample t-tests were used to compare initial VHI-10 scores of patients with a history of anxiety or depression, as well as patients treated with anxiolytics or antidepressants. **Results:** Four hundred and seventy-five cases were analyzed. In patients with benign dysphonia, no difference was seen between initial VHI-10 scores of those with or without anxiety or depression. The difference in VHI-10 scores for patients with ALM based on mental health history was 5.5 (p=0.08). The difference for patients with ALM based on pharmacologic mental health treatment was 4.9 (p=0.12). **Conclusions:** Patients with a history of anxiety or depression who presented with dysphonia due to ALM, rather than an underlying anatomic problem, had higher VHI-10 scores than those without a mental health history. Future cohort studies may clarify if treatment of mental health conditions can impact patient reported vocal function.

88. Forestier's Disease as a Rare Cause of Acute Respiratory Failure

James A. Hubert, DO, Athens, OH; Brandon Fornwalt, DO, Boardman, OH; John Babyak, MD, Boardman, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize acute airway obstruction as a potential complication of Forestier's disease and assess the benefit of prophylactic surgical intervention.

Objectives: To report a case of Forestier's disease, also known as diffuse idiopathic skeletal hyperostosis (DISH), as a rare cause of acute airway obstruction and respiratory failure. **Study Design:** Case report. **Methods:** The patient's medical record was reviewed for demographic and clinical data. For literature review, all case reports or other publications published in English literature were identified using PubMed. **Results:** A 62 year old male patient presented to the emergency department with acute onset of shortness of breath. In the ED, the patient experienced episodes of increased stridor and work of breathing. The patient was provided a racemic epinephrine treatment and taken to obtain a CT scan with contrast of neck and soft tissues, which was indicative of anterior osteophytes from C3-C7 with mass effect on the esophagus. Overnight, he continued to decline as his oxygen saturation dropped to 54% and he became profoundly cyanotic. He was emergently intubated and admitted to the ICU. Following discharge, he underwent surgical removal of the osteophytes which relieved the patient of symptoms and effectively cured him of this disease. **Conclusions:** Forestier's disease is a commonly benign condition and affects many elderly individuals. Because Forestier's disease commonly presents as a nonemergent pathologic process, surgical management is rarely indicated. However, on rare occasions, this pathology can present with acute airway obstruction and respiratory failure. Otolaryngologists should consider Forestier's disease in the differential diagnosis of dysphagia and dysphonia and consider early surgical consultation to prevent life threatening airway complications.

89. Asymptomatic Bilateral Laryngeal Arteriovenous Malformations in a Young Adult

Alexander M. Knops, BA, Philadelphia, PA; Cory D. Bovenzi, MD, Philadelphia, PA; Colin Huntley, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss this case of a vascular malformation in the larynx, as well as consider vascular lesions and their treatment in future clinical workup.

Objectives: Discuss the presentation and management of rare bilateral vascular malformations in the larynx. **Study Design:** Case report and literature review. **Methods:** Case report with review of published literature. **Results:** We present a case of a 28 year old female who was referred to our clinic for workup of laryngeal masses, discovered incidentally on laryngoscopy by an outside otolaryngologist during evaluation for chronic rhinosinusitis and migraines. Nasopharyngolaryngoscopy with stroboscopy was performed at our center and demonstrated bilateral smooth masses with a blue hue protruding from the aryepiglottic folds, without involvement of the vocal folds. MRI showed well circumscribed lesions protruding from the posterior aryepiglottic folds that demonstrated hyperintensity on T2 and postcontrast enhancement consistent with vascular or lymphovascular pathology. Treatment consisted of microdirect laryngoscopy with CO2 laser excision of right sided mass; the left mass was deferred to reduce the risk of scarring and glottic stenosis. Pathology was consistent with a submucosal arteriovenous malformation. The patient tolerated the procedure well and without complication. Excision of the left sided lesion will occur in the near future pending repeat evaluation. **Conclusions:** Vascular malformations of the head and neck region are not uncommon but are usually confined to the oral or nasal cavity. When present in the larynx, malformations may become detected as they progress and patients develop symptoms of dysphagia, bleeding, or airway compromise. Depending on the accessibility of the lesion, treatment may involve surgical excision or endovascular sclerotherapy/embolization. To our knowledge, this is the first description of bilateral laryngeal vascular malformations.

Otology/Neurotology

90. Patient Specific Temporal Bone Simulation Based on Cone Beam Computed Tomography: Clinician Feedback on Virtual Reality Otologic Surgery

Steven Arild Wuyts Andersen, MD PhD, Columbus, OH; Varun V. Varadarajan, MD, Columbus, OH (Presenter); Bradley Hittle, BSc, Columbus, OH; Kimberly Powell, PhD, Columbus, OH; Gregory J. Wiet, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the current capabilities of patient specific virtual reality simulation of temporal bone surgery.

Objectives: Patient specific surgical simulation allows presurgical planning through 3D visualization and virtual rehearsal. Virtual reality simulation for otologic surgery can be based on high resolution cone beam computed tomography (CBCT) but requires image processing and segmentation of anatomic landmarks. This study aimed to evaluate clinicians' experience with patient specific simulation of mastoid surgery. **Study Design:** Prospective, multi-institutional study. **Methods:** Preoperative temporal bone CBCTs scans of patients undergoing cochlear implantation were retrospectively obtained and de-identified. Automated processing and segmentation routines were used. Otologic surgeons performed a complete

mastoidectomy with facial recess approach on the patient specific virtual cases in the OSU-TB simulator. Participants completed surveys regarding the accuracy and utility of the simulation. **Results:** 22 clinical CBCTs were obtained. 4 neurotologists and 5 surgical trainees enrolled in the study. The mean number of simulations completed by each participant was 17 (range 3-22). "Overall experience" and "usefulness for presurgical planning" was rated as "good", "very good" or "excellent" in 84.5% and 71.2% of the simulations, respectively. In 10.7% of simulations, the surgeon reported to have gained a significantly greater understanding of the patient's anatomy compared to standard imaging (e.g., facial recess pneumatization). Participants were able to better appreciate subtle anatomic findings after using the simulator for 60.4% of cases. Variable CBCT acquisition quality was the most reported limitation. **Conclusions:** Patient specific simulation using preoperative CBCT is feasible and potentially provides valuable insights prior to otologic surgery. Establishing a CBCT acquisition protocol that allows for consistent segmentation is essential for reliable surgical simulation.

91. Awareness and Management of Sudden Sensorineural Hearing Loss: A Survey of Emergency Medicine Physicians and Medical Students

Jeffrey Mark Bergeron, MD, New Orleans, LA; Roxanne Daban, BS, New Orleans, LA; Neal Jackson, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the knowledge gap and practice patterns of emergency medicine physicians and medical students with regards to sudden sensorineural hearing loss.

Objectives: This study aims to identify the level of knowledge of 4th year medical students (MS4) and emergency medicine physicians regarding SSNHL. **Study Design:** Anonymous electronic survey. **Methods:** An anonymous electronic survey was administered via Google forms. The survey was sent to all current emergency medicine residency coordinators in the United States, as well as the dean of students of allopathic medical schools in the United States. The survey was then distributed to current 4th year medical students, emergency medicine residents, fellows, and attending physicians. **Results:** There were 311 responses to the survey. 11 responses came from medical students below 4th year and were excluded. 108 4th year students responded, and 192 emergency medicine residents, fellows, and staff responded. 63% of respondents had never heard of SSNHL at the time of the survey. The most common response to the clinical vignette was to perform a CT head and obtain routine bloodwork. **Conclusions:** We conclude that there is a lack of awareness of SSNHL amongst both 4th year medical students and emergency medicine physicians. Directed teaching at both the undergraduate and graduate levels of medical education may help to improve knowledge amongst providers and eventually outcomes for patients with SSNHL.

92. Squamous Cell Carcinoma of the Middle Ear: A National Cancer Database Study

Mia J. Bertoli, BS, Newark, NJ; Benjamin Zhou, BS, Newark, NJ; Judith Z. Ezike, BA, Newark, NJ; Sara Behbahani, MS, Newark, NJ; Robert Jyung, MD, Newark, NJ

Educational Objective: Understand the demographics and prognostic factors of squamous cell carcinoma of the middle ear.

Objectives: Middle ear squamous cell carcinoma (MESCC) is an extremely rare cancer associated with a history of chronic otitis media. Due to its rarity, demographic features, management, and survival are poorly understood. Larger studies are needed to analyze the factors that influence survival. **Study Design:** Database study. **Methods:** A query of the National Cancer Database (NCDB) from 2004-2016 identified 214 histologically confirmed cases of MESCC. Kaplan-Meier (KM) univariate and Cox multivariate survival analyses were performed on cases where MESCC was the primary malignancy (n=159). **Results:** Median overall survival (OS) was 1.5 years. The average age of diagnosis was 67.8 years with 72.9% age 60 or above. Men (55.6%) and women (44.4%) were affected equally (p=0.621). The most common treatment was surgery with radiation (33.6%) followed by surgery alone (21%). The 1 year and 5 year OS was 63.6% and 30.2%, respectively. On univariate KM analysis, females showed decreased 1 year (59.20%) and 5 year (25.6%) OS compared to their male counterparts (1 year OS= 68.2%; 5 year OS=34.8%) (p=0.08). When adjusting for age, sex, race, surgery, chemotherapy, tumor grade, insurance status, CDCC score, facility type, and lymph node involvement (LNI), Cox regression showed that females (ref: males; HR=2.36; 95% CI [1.36-4.09]; p=0.002) and LNI (ref: negative LNI; HR=4.83; 95% CI [1.80-12.95]; p=0.002) were associated with decreased OS. **Conclusions:** Patients with MESCC have a relatively poor prognosis. Our study demonstrates that while MESCC affects males and females almost equally females have a worse overall prognosis. Future studies are needed to better understand the role of gender in MESCC.

93. Prophylactic Migraine Treatment Outcomes in Patients with Stapedial Myoclonus

Jack L. Birkenbeuel, BS, Irvine, CA; Mehdi Abouzari, MD PhD, Irvine, CA; Khodayar Goshtasbi, MS, Irvine, CA; Ariel Lee, BS, Irvine, CA; Harrison W. Lin, MD, Irvine, CA; Hamid R. Djalilian, MD, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand 1) identified triggers for SM are similar to established triggers for migraine; 2) tere is an association between SM and migraine; and 3) there is a potential novel treatment for SM.

Objectives: To describe a case series of patients with stapedial myoclonus (SM) whose conditions improved after prophylactic migraine treatment. **Study Design:** Retrospective case series. **Methods:** Six patients with SM, with an average age of 45 years, suffering from concurrent migraine symptoms, including those with headache, dizziness, vertigo, and nausea were included. All patients were treated with a standard prophylactic migraine protocol used at our neurotology clinic. The migraine regimen consisted of dietary, stress, and sleep modifications to avoid migraine triggers, supplementation with vitamin B2 200 mg bid and magnesium oxide 400 mg bid, and migraine prophylactic medication (e.g., nortriptyline or verapamil) with dose escalation if needed. The main outcome measure was reduction or resolution of SM symptoms at 2 month followup. **Results:** SM in all 6 patients improved from baseline. 67% of patients noted significant (>50%) improvement, with a reduced frequency, duration, and intensity of their symptoms. The remaining 33% of patients experienced complete resolution of SM with their migraine treatment. Response to treatment varied. Caffeine cessation alone resolved the SM in 17% of patients. Lifestyle modifications, including use of vitamin B2 and magnesium qualitatively improved SM symptoms in 50% of patients. Nortriptyline (10-20-30 mg) or verapamil addition (120-180-240 mg) with dose escalation was needed to significantly improve or fully resolve symptoms in the remaining 33%. **Conclusions:** Treatment with prophylactic migraine treatment can provide long term relief for patients with SM, which may suggest an etiological association between migraine and SM as well as a possible treatment for SM.

94. Otopathologic Analysis of Incudomalleolar Joint Fusion

Melissa Castillo-Bustamante, Boston, MA; Prithwijit Roychowdhury, BS, Boston, MA; Marc Polanik, BA, Boston, MA; Dhrumi Gandhi, MS, Boston, MA; Elliott Kozin, MD, Boston, MA; Aaron Remenschneider, MD MPH, Boston, MA

Educational Objective: Osteoarthritis (OA) is the most common type of polyarthritis. Cartilage, synovial space and bone are affected over the duration of the disease. Ear involvement is not well known and previous studies on the otopathology of OA have not been reported. Herein, we otopathologically report a case with fusion of the incudomalleolar joint in a patient with OA.

Objectives: The diarthrodial incudomalleolar joint (IMJ) is a synovial articulation capable of complex 3 dimensional motion. Ankylosis of the IMJ has been reported in aged temporal bones, but not in those with systemic polyarthritis. Herein, we present a case of complete IMJ obliteration with resultant ossicular fusion in a patient with history of severe osteoarthritis (OA) and hearing loss (HL). **Study Design:** Otopathologic analysis. **Methods:** Otopathologic analysis via light microscopy was performed for the referenced ear. Findings were compared to ears of rheumatoid arthritis (RA) (n=21) and age matched controls (n=18). **Results:** A female patient reported bilateral progressive HL beginning at age 17 necessitating hearing aids by age 27. At age 61 an air conduction audiogram demonstrated right severe HL and left profound HL. She had no history of infections or surgery in the right ear. Her clinical history was notable for severe OA. Otopathologic review demonstrated complete fusion of the right IMJ with bony proliferation, loss of hyaline and calcified cartilage and complete obliteration of the synovial space. Multinucleated giant cells consistent with osteoclasts were identified along the periphery of the incus and malleus, osteoblasts populated the new bone formation of the fused IMJ. Cochlear findings included age normal hair cell populations and mild atrophy of the organ of Corti. No RA or control cases demonstrated proliferative bone formation or osteoclastic activity at the IMJ. **Conclusions:** Fusion of the IMJ may be considered a potential etiology of idiopathic conductive HL. Further clinical and audiometric studies in patients with OA are needed to determine if an association exists.

95. Screening for Eustachian Tube Dysfunction in Clinical Practice Using the ETDQ-7

Emily Ann Commesso, MD, Durham, NC; Thomas Risoli, MS, Durham, NC; Sarah Peskoe, PhD, Durham, NC; David Kaylie, MD, Durham, NC; Theresa Coles, PhD, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to evaluate the ETDQ-7ΓÇÖs ability to distinguish patients with eustachian tube dysfunction from patients with similarly presenting clinical conditions.

Objectives: To evaluate the ability of the Eustachian Tube Dysfunction Questionnaire -7 (ETDQ-7) to distinguish between patients with eustachian tube dysfunction (ETD) and non-ETD diagnoses. **Study Design:** Case control. **Methods:** Consecutive patients presenting to health system's ear nose and throat (ENT) clinics were administered the ETDQ-7 and additional symptom items from October 2019-April 2020. Electronic health records were retrospectively reviewed for demographic and diagnostic information. Adult patients with eustachian tube dysfunction, non-eustachian tube dysfunction ear fullness, and normal/patients without ETD or ear fullness were included. **Results:** Of the 108 patients included in this study 74 (68.5%) were diagnosed with ETD. ETDQ-7 scores distinguished between subjects with ETD and normal (3.1 (SD 1.6) vs. 2.2. (SD 1.5); p=0.006). There was no significant difference between ETDQ-7 scores for ETD and non-ETD patients (p=0.389). The addition of additional symptom items to the ETDQ-7 improved area under the curve for receiver operating

characteristics curves for all diagnoses (0.577 v. 0.769; 0.679 v. 0.804, 0.722 v. 0.841 for ETD, non-ETD and normal respectively). **Conclusions:** The ETDQ-7 does not distinguish well between patients with eustachian tube dysfunction and similarly presenting non-eustachian tube dysfunction diagnoses: individuals complaining of ear fullness. The addition of symptom items to the ETDQ-7 improves predictability and provides evidence that additional patient reported symptoms may need to be obtained to accurately distinguish ETD from other similar diagnoses.

96. Readability Analysis of Vestibular Disorder Patient Reported Outcome Measures

Christina Dorismond, Chapel Hill, NC; Michael W. Canfarotta, MD, Chapel Hill, NC; Zainab Farzal, MD MPH, Chapel Hill, NC; Kevin D. Brown, MD PhD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the readability of patient reported outcome measures for vestibular disorders and understand the implications for health outcomes.

Objectives: Patient reported outcome measures (PROMs) are critical tools in communicating patients' subjective health experiences. For vestibular disorders, they can be used for screening or evaluation of symptom management. In order to be useful, however, PROMs must be written at a reading level appropriate for most patients. To this end, health literacy experts suggest text should be written at or below the 6th grade reading level. The objective of this study was to assess the readability of vestibular disorder PROMs and their adherence to readability recommendations. **Study Design:** Descriptive review. **Methods:** Publicly available PROMs designed to assess vestibular disorders were reviewed. Readability was analyzed via three metrics: Gunning Fog, Simple Measure of Gobbledygook (SMOG), and FORCAST. PROMs with readability scores of ≤ 6.9 (6th grade level or below) were considered to have met the recommended reading grade level set forth by health literacy experts. **Results:** A total of 8 PROMs were reviewed. Only 2 PROMs when measured by Gunning Fog and 1 when measured by SMOG and by FORCAST met readability recommendations. No individual PROM met recommendations when measured by all 3 metrics. The average reading grade level across all PROMs for the Gunning Fog, SMOG and FORCAST metrics were 8th grade (8.2, standard deviation [SD] 2.04), 8th grade (8.9, SD 1.85), and 10th grade (10.7, SD 1.75), respectively. **Conclusions:** PROMs for vestibular disorders are consistently written above the recommended 6th grade reading level. This may contribute to poorer health outcomes in patients with low health literacy and should be carefully considered.

97. Hearing Preservation after the Middle Cranial Fossa Approach to Vestibular Schwannomas in Patients with Neurofibromatosis Type 2: A Systematic Review and Meta-Analysis

Abhishek Gami, BS, Baltimore, MD; Kaitlyn M. Frazier, MD, Baltimore, MD; Daniel Q. Sun, MD, Baltimore, MD; C. Matthew Stewart, MD PhD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to counsel patients with neurofibromatosis type 2 on the rate of serviceable hearing preservation after resection or decompression of vestibular schwannomas via the middle cranial fossa.

Objectives: Microsurgical excision of intracanalicular vestibular schwannomas via the middle cranial fossa (MCF) approach in patients with neurofibromatosis type 2 (NF2) offers opportunity for definitive tumor control and hearing preservation. This study analyzes the rate of reported serviceable hearing preservation (HP) in NF2 patients undergoing VS excision via MCF approach. **Study Design:** Systematic review and meta-analysis (PRISMA guidelines). PubMed, Embase, Scopus, Web of Science, and Cochrane databases were queried for studies in English reporting hearing outcomes after MCF approach for VS in NF2 patients. **Methods:** 7 studies representing 164 unique operated ears and 120 patients undergoing VS resection and 4 studies representing 83 operated ears undergoing decompression met hearing documentation eligibility criteria from an identified 139 publications. Case volume, patient characteristics, followup time, and hearing classes were recorded. Serviceable HP rates were calculated as maintenance of preoperative hearing ≤ 50db PTA and ≥ 50% WRS (AAO-HNS class A-B) as well as by ≥ 50% WRS (WRS class I-II). **Results:** Mean age was 19.9 years and mean tumor size was 1.1 cm in patients undergoing VS resection. Overall hearing preservation was 58% (95% CI 49-67%) for AAO-HNS class A-B and 60% (95% CI 52-69%) for ΓëÑ50% WRS in patients with NF2 undergoing VS resection. There was little cross-study heterogeneity (I2=0.00%, ≡¥£Å2=0.00, p=0.00, ≟ç2=5.02, p=0.54) but no significant publication bias in studies examining surgical resection. In patients undergoing decompression via the MCF, hearing preservation was 93% by both AAO-HNS class A-B and ΓëÑ50% WRS definitions. **Conclusions:** The MCF approach may offer hearing preservation and tumor control in patients with NF2.

98. Tinnitus and Subjective Hearing Loss Are More Common in Migraine: A Cross-Sectional NHANES Analysis

Khodayar Goshtasbi, MS, Irvine, CA; Mehdi Abouzari, MD PhD, Irvine, CA; Navid Mostaghni, BS, Irvine, CA; Brooke Sarna, BS, Irvine, CA; Ariel Lee, BS, Irvine, CA; Hamid R. Djalilian, MD, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to compare rates of tinnitus or hearing loss among people with migraine compared to people without migraine.

Objectives: To investigate the possible association between migraine with tinnitus and subjective hearing loss (HL) in a large national database. **Study Design:** Retrospective study of a de-identified national database. **Methods:** The 1999-2004 National Health and Nutrition Examination Survey (NHANES) which included patient reported migraine, HL, and tinnitus was queried for subjects aged 18-65. The migraine question was removed after 2004, making this the most recent cohort for analysis. **Results:** A total of 12,962 subjects (52.9% female) with a mean age of 38.1 ± 14.6 years were included. This consisted of 2,657 (20.5%), 2,344 (18.1%), and 2,582 (19.9%) subjects who had migraine, subjective HL, and tinnitus, respectively. In patients with tinnitus or subjective HL, migraine was reported in 35.6% and 24.5%, respectively. Migraineurs were more likely to have subjective HL (25.0% vs. 16.6%, $p<0.001$) and tinnitus (34.6% vs. 16.9%, $p<0.001$) compared to the non-migraineurs. This corresponded to migraine having an odds ratio of 1.5 (95% CI 1.3-1.7, $p<0.001$) and 2.2 (95% CI 2.0-2.4, $p<0.001$) for subjective HL and tinnitus, respectively. After adjusting for confounders, subjective HL (OR=1.2, 95% CI 1.1-1.4, $p=0.003$), tinnitus (OR=2.1, 95% CI 1.9-2.3, $p<0.001$), and neck pain (OR=4.0, 95% CI 3.6-4.5, $p<0.001$) were more common in migraineurs. Migraine patients tended to be female (69% vs. 49%), slightly older (39 ± 13 vs. 38 ± 15 years) with marginally higher BMI (29 ± 7 vs. 28 ± 6) compared to non-migraineurs, while race was similarly distributed. **Conclusions:** This study suggests an independent association between migraine with HL and tinnitus. A similar underlying pathophysiology (i.e., otologic migraine) may exist between these conditions.

99. Hearing Related Quality of Life in Children and Adolescents: Results from the Hearing Norton Sound Randomized Trial Cohort

Kelli L. Hicks, MD, Chapel Hill, NC; Samantha Kleindienst Robler, PhD AuD, Nome, AK; Ryan A. Simmons, MB, Durham, NC; Alexandra A. Ross, MHS, Durham, NC; Joseph R. Egger, PhD, Durham, NC; Susan D. Emmett, MD MPH, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants will be able to discuss the use of HEAR-QL in both children and adolescents in a rural state.

Objectives: This study evaluated hearing related quality of life in a rural state using the Hearing Environments and Reflection on Quality of Life (HEAR-QL) questionnaire, including an addendum crafted through community feedback to more accurately reflect the environment and context of the rural state. The objective of this study was to characterize the relationship between HEAR-QL and hearing loss in a native population. **Study Design:** The HEAR-QL questionnaires for children and adolescents were administered in a cluster randomized trial in a rural state. A cross-sectional evaluation of enrollment questionnaires was utilized for this analysis. Audiometric evaluation and HEAR-QL administration were performed on the same day. **Methods:** Students in a school district of this state from October 2017 through March 2019 completed the HEAR-QL questionnaire and audiometric evaluation. **Results:** A total of 733 children (ages 7-12 years) and 440 adolescents (ages >13 years) completed the questionnaire. Median HEAR-QL scores were similar among children with and without hearing loss (Kruskal-Wallis, $p=0.46$); however, adolescent HEAR-QL scores significantly decreased with increasing grade of hearing loss ($p<0.01$). HEAR-QL was significantly lower in both children ($p=0.01$) and adolescents ($p<0.01$) with middle ear disease compared to those without. In both children and adolescents, the addendum scores correlated with the total HEAR-QL score ($\rho_{Spearman} = 0.72$ and 0.69, respectively). **Conclusions:** The expected negative association between hearing loss and HEAR-QL score was observed in adolescents but not children, suggesting that the HEAR-QL instrument may be a valid measure of quality of life for adolescents but not children in this native population.

100. Resolution of Otorrhea for Patients Undergoing Mastoidectomy with Antibiotic Catheter Irrigation

Joel William Jones, MD MBA, Pittsburgh, PA; Todd Hillman, MD, Pittsburgh, PA; Douglas Chen, MD, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the outcomes for mastoidectomy with indwelling antibiotic catheter irrigation in patients with chronic otorrhea.

Objectives: To evaluate the effectiveness of mastoidectomy with antibiotic catheter irrigation in patients with chronic tympanostomy tube otorrhea or a draining perforation. **Study Design:** Retrospective chart review. **Methods:** A retrospective chart review from 2001-2020 was performed on 25 patients and 26 ears that underwent mastoidectomy with placement of a temporary indwelling catheter for persistent otorrhea. All patients had failed outpatient medical management and had preoperative imaging. Patients were retrospectively followed for recurrent drainage after 2 months and outcomes were categorized as resolution (0 or 1 episodes of otorrhea or resolving otitis media with effusion during followup), improvement (2 - 3 episodes), or failure (>3 episodes). **Results:** Median age was 45 years (interquartile range, IQR=29-60). There were 22 draining ears (85%) with a tympanostomy tube and 4 with a perforation. The median duration of otorrhea

from referral was 4 months (IQR=2-10). Fifteen ears had resolution of drainage, 7 had improvement, and 4 failed. The observed percentage of resolved/improved ears (85%) was significant (P<.001, 95% CI=63.5-93.9%). Median followup time was 24 months (IQR=12-50.5). Pre and postoperative pure tone averages improved (difference of medians = -3.3 dB, P=.01) with no difference in word recognition scores (P=.76). Methicillin resistant staphylococcus aureus was the most common isolated microbe on available preoperative cultures while no growth was most frequently noted on intraoperative culture. **Conclusions:** Mastoidectomy with antibiotic catheter irrigation may be an effective surgical strategy in patients with persistent otorrhea who have failed topical and oral antibiotics. Failures in this study were associated with patients who had an immunocompromised state.

101. Central Auditory Pathway Findings in Patients with Chronic Traumatic Encephalopathy: A Histopathological Study

Renata M. Knoll, MD, Boston, MA; Raymond Nicks, MS, Boston, MA; Aaron K. Remenschneider, MD MPH, Boston, MA; Victor E. Alvarez, MD, Boston, MA; Elliott D. Kozin, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the effects of repeated concussive head trauma on the central auditory pathway.

Objectives: Chronic traumatic encephalopathy (CTE) is a neurodegenerative disease associated with repeated exposure to concussive head trauma. Auditory symptoms have been anecdotally associated with CTE; however, the precise pathophysiology remains unknown. Herein, we aim to investigate if neuropathological changes occur along the central auditory pathway (CAP) in postmortem patients with confirmed diagnosis of CTE. **Study Design:** Histopathological study. **Methods:** Specimens were obtained from our brain bank. A total of 18 brains from patients with a confirmed neuropathological diagnosis of CTE (nine early stage and nine late stage) were evaluated by light microscopy. Six additional brains from cognitively intact individuals without history of mild repetitive head injury were used as controls. Specimens were immunohistochemically assessed for presence and quantification of hyperphosphorylated tau (p-tau) deposition and/or neurofibrillary tangles (NFTs) in the auditory cortex and inferior colliculus. **Results:** Neuropathological changes were found along the CAP in patients with CTE. NFT deposition in the auditory cortex and inferior colliculus was greater in patients with CTE than controls (p=.010 and p=.009, respectively). There was a significant positive correlation between NFT deposition and stage of CTE in the auditory cortex (r:.482, p=.037). **Conclusions:** This is the first histopathological study to examine the CAP in individuals with CTE. Neuropathological changes in the CAP were found in patients with CTE and are positively associated with increasing CTE stage severity. Further studies are warranted with a larger number of specimens to better characterize neuropathologic change at each stage.

102. Seasonal Trends in Sudden Sensorineural Hearing Loss: A Meta-Analysis

Ariel Lee, BS, Irvine, CA; Tyler Yasaka, BS, Irvine, CA; Mehdi Abouzari, MD PhD, Irvine, CA; Adwight Risbud, BS, Irvine, CA; Kathryn K. Rosenbaum, BS, Irvine, CA; Hamid R. Djalilian, MD, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the relationship between seasonality and incidence of sudden sensorineural hearing loss.

Objectives: To evaluate whether there are seasonal trends in the incidence of sudden sensorineural hearing loss (SSNHL). **Study Design:** Meta-analysis. **Methods:** A literature search was performed in the PubMed, Ovid, and Cochrane databases for publications analyzing the relationship between SSNHL and weather. Studies reporting data on incidence by season were included in the final analysis. Meta-analysis was performed to estimate the proportion of incidence occurring in each of the 4 seasons. The estimated proportion for each season was tested against the null hypothesis of 25% proportion (i.e., even distribution among seasons) to determine whether there were any seasonal correlations. **Results:** A total of 11 papers analyzing the relationship between SSNHL and weather were identified, of which 6 reported seasonal incidence in a manner suitable for the meta-analysis. The estimated proportions of SSNHL incidence by season were 21.7% in winter, 32.1% in spring, 22.2% in summer, and 24.4% in fall. The estimated proportions for winter ($p = 0.046$) and spring ($p < 0.001$) rejected the null hypothesis of 25% proportion with statistical significance at a threshold of $p < 0.05$. **Conclusions:** Our results suggest a seasonal trend in the incidence of SSNHL. SSNHL onset is less likely to occur during winter and more likely to occur during spring. Further large population based studies are needed to confirm these findings.

103. Characterization of the Round Window Niche Using 3D Reconstruction of Micro CT Images

Eleni Mijalis, BS, Shreveport, LA; Jason Calligas, MD, Shreveport, LA; Norman Wendell Todd, MD MPH, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should have an improved understanding of round window niche anatomy and be able to discuss the implications of anatomical variations on cochlear implantation.

Objectives: 1) To create 3D models of the round window niche and surrounding structures through micro CT reconstruction; and 2) to identify consistent anatomical landmarks across 3D models in order to calculate inter-landmark distances and round window niche dimensions. **Study Design:** Cadaveric imaging study. **Methods:** Micro CT images of 22 human cadaveric temporal bones from 11 subjects were obtained. DICOM segmentation and volume reconstruction were performed using 3DSlicer, and Meshmixer was used for surface reduction and smoothing. Points were placed on the model surface by two separate investigators at discrete landmarks using the ImageJ 3D Viewer plugin. Distances between coordinates were calculated using the Pythagorean theorem in three dimensions. Inter-observer agreement and symmetry were calculated using Pearson's correlation coefficient. **Results:** The crista fenestra, defined as the point where the round window annulus meets inferiorly and extends into the scala tympani, was identified in all 22 ears. Inter-observer agreement and bilateral symmetry were strong (R>0.7) for distances between the following landmark pairs: crista fenestra and superior aspect of round window annulus; niche bony overhang and superior aspect of round window annulus; infundibulum (round window nadir) and niche roof. The mean bony overhang was 1.82 ± 0.07 mm, and the mean height of the round window niche was 1.13 ± 0.06 mm. **Conclusions:** Micro CT 3D reconstruction is a valuable tool for inspecting round window niche morphology and measuring the bony overhang and niche height. These measurements are surgically relevant and may be beneficial when drilling the bony overhang and finding the optimal insertion vector during cochlear implant surgery. The apex of the crista fenestra was consistently identified and was visible through the round window niche in each of the 22 ears. The bilateral symmetry that was found is consistent with genetic control of the ontogeny of studied structures.

104. Screening Tool for Adult Cochlear Implant Referral: Predicting Candidacy Using a Logistic Regression Model

Stephany Joy Ngombu, BA, Columbus, OH; Christin Ray, PhD, Columbus, OH; Kara J. Vasil, AuD, Columbus, OH; Aaron C. Moberly, MD, Columbus, OH; Varun V. Varadarajan, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss how a predictive model may be developed and used as a tool for identifying patients who are highly likely to meet audiologic criteria for cochlear implant candidacy.

Objectives: Cochlear implantation (CI) is a well established treatment for sensorineural hearing loss. Due in part to a lack of referral guidelines, the technology remains underused and patients who would benefit from CI with borderline audiometric performance may not be referred. This study aimed to develop a model for predicting CI candidacy using routine audiometric measures. **Study Design:** Retrospective review at tertiary referral center. **Methods:** Medical records of adults undergoing CI evaluation were reviewed. Three frequency pure tone average (PTA), speech discrimination score (SDS), and best aided sentence testing with AZBio sentence lists were recorded. Candidacy was defined by meeting traditional (AZBio score ≤ 60%) and Medicare criteria (≤ 40%). A logistic regression model was developed to predict candidacy with better ear PTA and SDS. Confusion matrices were plotted to determine the sensitivity and specificity of the models with various probability thresholds. **Results:** 350 subjects were included. PTA and SDS were significant predictors ($p < 0.001$). The models were capable of predicting probability of candidacy for both traditional and Medicare criteria ($p < 0.001$). For traditional criteria, sensitivity and specificity ranged from 96% to 81% and 38% to 68%, respectively, using probability cutoffs of .40 to .60. For Medicare, sensitivity and specificity ranged from 89% to 70% and 50% to 75%, respectively, using probability cutoffs of .31-.51. **Conclusions:** Probability of CI candidacy may be determined using a novel screening tool for referral. The model allows for individualized counseling and may be modified based on an institution's philosophy regarding an acceptable false positive rate.

105. Sudden Sensorineural Hearing Loss during the Covid-19 Pandemic

Marc D. Polanik, BA, Boston, MA; Michael J. Wang, BS, Worcester, MA; Judith S. Kempfle, MD, Boston, MA; Elliott D. Kozin, MD, Boston, MA; Aaron K. Remenschneider, MD MPH, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss potential etiologies of this observation and understand the importance of reviewing internal protocols to ensure the proper identification of patients with urgent otologic conditions during the Covid-19 pandemic.

Objectives: Sudden sensorineural hearing loss (SSNHL) is an otologic emergency. Given the decrease in patient volume as a result of the Covid-19 pandemic, there is a concern that patients with SSNHL may have a delay in diagnosis. Herein, we aim to compare the incidence of SSNHL over a four year period at a single tertiary care center. **Study Design:** Single institution, retrospective chart review. **Methods:** All patients with a diagnosis of SSNHL at a single tertiary care center between January and July of 2017-2020 were identified. Patients with known secondary causes of sudden hearing loss

(e.g., vestibular schwannoma, Meniere's, etc.) were excluded. The volume of SSNHL cases was calculated for the January to July period of the 2020 Covid-19 pandemic. This was compared to the same seven month period of the previous three years. **Results:** Seventy-two patients were included. The mean age at diagnosis was 54.0 years and 63% of patients were male. During the Covid-19 pandemic, 27 cases of SSNHL were diagnosed. These patients' Covid status was unknown. This compares to an average of 15 cases (range 9-20) annually in the previous three years. There were no significant differences in patient age or gender between years. **Conclusions:** Cases of SSNHL at our institution nearly doubled during the Covid-19 pandemic compared to previous years. Although this suggests new cases are being adequately identified, it is unclear if the increased incidence is related to viral infection, environmental/social changes, or altered patient referral patterns. Additional study across multiple institutions is needed to better understand this observation.

106. High Frequency Hearing Outcomes following Stapes Surgery

Prithwijit Roychowdhury, BS, Worcester, MA; Marc Polanik, BA, Worcester, MA; Judith S. Kempfle, MD, Boston, MA; Melissa Castillo Bustamente, MD, Boston, MA; Cheryl Fickucki, AuD, Worcester, MA; Aaron K. Remenschneider, MD MPH, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the difference in air bone gap closure between low and high frequencies following stapes surgery.

Objectives: Hearing outcomes after stapes surgery are conventionally reported utilizing a pure tone averaged air bone gap (ABG) biased towards low frequencies. Large postoperative high frequency ABGs may result in ongoing hearing difficulties. In this study, we evaluated changes in low and high frequency ABG in stapedotomy patients. **Study Design:** Retrospective review. **Methods:** All patients who underwent primary stapedotomy with incus wire piston prosthesis between January 2016 and May 2020 were included. Pre and postoperative audiograms were evaluated, and low frequency ABG was calculated as the mean ABG of thresholds at 250, 500, and 1000Hz. High frequency ABG was calculated at 4000Hz. **Results:** Forty-five patients met criteria. Mean age at surgery was 54.1 years (range, 31-82 years). The KTP laser was used in 27 (60.0%) and the CO2 laser was used in 18 (40.0%) cases. Fifteen patients (33.3%) required additional footplate fenestration with a 0.8mm diamond bur. At low frequencies, mean preoperative ABG was 36.7 ± 11.0. Postoperatively, this was significantly reduced to 8.78 ± 6.21, ($P<0.001$). Preoperative high frequency ABG was 30.9 ± 14.5 and postoperatively, this significantly reduced to 14.3 ± 12.4, ($P<0.001$). At low frequencies, the magnitude of ABG closure was nearly twice the size of ABG closure at 4kHz ($P<0.001$). **Conclusions:** Stapes surgery achieved significant hearing improvement at all frequencies, but clinically relevant ABGs remained at 4000Hz. Further understanding of high frequency sound conduction and mechanics following stapes surgery is needed to improve postoperative high frequency hearing outcomes.

107. Atypical Cutaneous Manifestation of Carney Complex: Hamartomatous Lesion Found within the External Auditory Canal (EAC) of a Patient with Carney Complex

Chandler B. Shapiro, BA, Stony Brook, NY; Ewen A. Chao, MD, Stony Brook, NY; Daniel F. Lozeau, MD, Stony Brook, NY; Lev Bangiyev, DO, Stony Brook, NY; David A. Schessel, MD PhD, Stony Brook, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the various cutaneous manifestations associated with Carney complex, while simultaneously recognizing that, while rare, hamartomas may present in patients with Carney complex.

Objectives: Carney complex (CNC) is an autosomal dominant neoplasia syndrome characterized by skin pigmentation (lentigines and blue nevi), myxomas (cardiac, cutaneous, mucosal, and breast), and endocrine hyperactivity often associated with primary pigmented nodular adrenocortical disease (PPNAD). Symptoms and severity of CNC are highly variable, but the presence of cutaneous lesions is strongly indicative and is the most prevalent clinical manifestation of CNC. We present the case of a 37 year old female with a known diagnosis of CNC and a history of an embolic intracranial stroke, recurrent atrial myxomas, and several cutaneous and mucosal cystic lesions. She presented to the clinic with a two month history of a painless lesion in her right external auditory canal (EAC). This report aims to shed light on an atypical cutaneous manifestation of CNC. **Study Design:** This is a case review of the presentation/radiology/pathology of a single interesting case involving a patient with CNC. **Methods:** The patient's medical records were reviewed and analyzed. **Results:** MRI imaging revealed a 1.2 cm exophytic heterogenous mass on the wall of the right external auditory canal without involvement of the temporomandibular joint. On excision, histopathology examination initially revealed hidrocystoma like elements, but deeper cuts also showed mucin and follicular elements, consistent with hamartoma. **Conclusions:** Hamartomas of the head and neck are rare. Although hamartomas are not commonly identified in patients with CNC, lentigines and thyroid adenomas are independently associated with PTEN hamartoma syndrome. The discussion will review our understanding of CNC, examine the characteristic radiological and pathological features of CNC, and evaluate the management of this unusual lesion.

108. Extensive Pleomorphic Adenoma Localized to the External Auditory Canal (EAC)

Chandler B. Shapiro, BA, Stony Brook, NY; Ewen A. Chao, MD, Stony Brook, NY; Lev Bangiyev, DO, Stony Brook, NY; David A. Schessel, MD PhD, Stony Brook, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate an understanding of pleomorphic adenomas originating in the external auditory canal and be able to recognize the malignant potential of this specific lesion.

Objectives: Pleomorphic adenomas are typically slow growing benign salivary tumors, predominately localized to the parotid gland. However, rarely they can arise from the ceruminous glands of the external auditory canal (EAC). We report a case of a 79 year old male who presented to the clinic with progressive right sided hearing loss, who had a previous tumor excised from the glands of his ear canal over 20 years ago. **Study Design:** This is a case review of the presentation/radiology/pathology of a single interesting case involving a patient with primary pleomorphic adenoma of the EAC. **Methods:** The patient's medical records were reviewed and analyzed. **Results:** Physical examination revealed a mildly erythematous, painless mass filling the entire right EAC. Audiogram showed a bilateral SNHL with an additional right sided CHL. CT and MRI showed an enhancing mass in the right EAC extending into the mastoid with no involvement of the parotid gland. FNA revealed epithelial cells in a background of myoepithelial cells and myxoid stromal fragments, consistent with pleomorphic adenoma. He underwent a right lateral temporal bone resection with lateral petrosectomy, with final pathology consistent with pleomorphic adenoma, with no evidence of carcinoma. **Conclusions:** Pleomorphic adenomas are benign tumors which can have malignant transformation. Treatment is wide surgical excision as residual deposits, especially of the myxoid subtypes, may lead to recurrence. Other tumors arising from the ceruminous glands must also be considered. Imaging, intraoperative appearance, and pathology in this case were all consistent with a primary EAC pleomorphic adenoma.

109. The Diagnostic Difficulties of a Meningioma Originating in the Internal Auditory Canal (IAC) with Extension into the Cerebellopontine Angle

Chandler B. Shapiro, BA, Stony Brook, NY; Ewen A. Chao, MD, Stony Brook, NY; David A. Schessel, MD PhD, Stony Brook, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss and recognize the diagnostic challenges associated with primary IAC meningiomas.

Objectives: The presence of a tumor within the internal auditory canal (IAC) extending into the cerebellopontine angle (CPA) is most likely indicative of a vestibular schwannoma, representing 80% of CPA tumors. However, intracanalicular meningiomas can clinically and radiologically mimic vestibular schwannomas leading to misdiagnoses. Thus, preoperative differentiation between these two lesions is often a diagnostic challenge. We report a case of a primary IAC meningioma involving the CPA. A 47 year old male presented to the clinic with a 9 month history of sensorineural hearing loss and tinnitus of the right ear with new onset of vertiginous episodes. **Study Design:** This is a case review of the presentation/radiology/pathology of a single interesting case involving a patient with a primary IAC meningioma. **Methods:** The patient's medical records were reviewed and analyzed. **Results:** MRI imaging revealed a 1.5 x 0.9 x 0.8 cm right cerebellopontine angle, porus acusticus centered enhancing lesion with no discernable expansion of the IAC. The posterior fossa portion of the tumor exhibited a dural tail. The patient underwent a right retrosigmoid suboccipital craniectomy. The primary IAC origin of the meningioma was identified intraoperatively. During surgical resection, the bulk of the meningioma was noted to be within the IAC. Histopathology revealed a meningothelial meningioma, WHO grade I. Immunohistochemistry results were as follows: S-100 negative, CD34 positive. **Conclusions:** Meningioma originating in the IAC is considered to be a particularly rare medical finding which is easily confused preoperatively with a schwannoma. Furthermore, as this type of lesion grows, it becomes increasingly difficult to distinguish from a CPA meningioma with secondary involvement of the IAC. Radiologic characteristics useful in preoperatively differentiating these lesions will be presented.

110. Healthcare Utilization for Meniere's Disease: Implications for Racial and Socioeconomic Health Disparities

Adam Thompson-Harvey, MD, Milwaukee, WI; David R. Friedland, MD PhD, Milwaukee, WI; Jazzmyne A. Adams, MPH, Milwaukee, WI; Ling Tong, MA, Milwaukee, WI; Kristen Osinski, MS, Milwaukee, WI; Jake Luo, PhD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, participants should be able to 1) recognize differences in prevalence of Meniere's disease among various demographic groups; 2) understand factors affecting otology utilization rates for patients with Meniere's disease; and 3) recognize the distinction between disease prevalence and health care disparities for Meniere's disease.

Objectives: To identify socioeconomic determinants of care and health disparities in patients with Meniere's disease. **Study Design:** Population based study of patients seeking tertiary otology care for Meniere's disease. **Methods:** Demographic characteristics (age, gender, race, insurance status, ZIP code) of 1,091 patients diagnosed with Meniere's disease were compared to population level data (median income, education level) to identify correlations between social determinants of health and tertiary otology utilization. **Results:** Patients seen for Meniere's disease were statistically significantly older (median: 65.0 years) and proportionally more female (55.8%) than those seen for other conditions in the otolaryngology clinic (58.8 years, 52.9% female) or the entire health system (50.8 years, 50.2% female). Otology utilization rates were positively correlated with median income. Utilization rates were also notably higher for patients from ZIP codes outside urban areas. Although 13.5% of residents in the region and 25.7% of residents in the local county are Black, only 2.7% of Meniere's disease patients were Black. When controlling for other social determinants of health, only median income and having any medical insurance were significantly correlated with utilization of otology care for Meniere's disease ($p<0.001$). **Conclusions:** We saw significant differences in otology utilization for Meniere's disease by age, race, and metropolitan vs rural locale. Some of these differences may be due to disparities in income and insurance status. However, the degree of disparity in utilization of otology services suggests hereditary or environmental factors in susceptibility to Meniere's disease.

111. Otosclerosis and Superior Semicircular Canal Dehiscence: A Review of Radiographic Concurrence

Ryan Thorwarth, MD, Phoenix, AZ; Nicholas Deep, MD, Phoenix, AZ; Lindsey Stull, MD, Phoenix, AZ; Joseph Hoxworth, MD, Phoenix, AZ; Peter Weisskopf, MD, Phoenix, AZ

Educational Objective: The educational objective of this submission is to review the clinical importance of concurrent otosclerosis and superior semicircular canal dehiscence (SSCD), and to establish the frequency this occurs on high resolution computed tomography. This is the largest study investigating the concurrence of otosclerosis and SSCD on imaging.

Objectives: The concurrence of superior semicircular canal dehiscence (SSCD) and otosclerosis has many clinical implications. Many have postulated concurrent disease may be a significant contribution to failed middle ear surgery for otosclerosis. This study aims to establish the rate of radiographic concurrence based on a large retrospective image review. **Study Design:** This is a descriptive study based on a retrospective image review. **Methods:** The records of all patients within a large hospital system over 23 years were reviewed for the presence of fenestral otosclerosis on radiology report. Strict technical inclusion criteria were then set for image quality. The images of 421 patients were reviewed by a board certified neuroradiologist and neurotologist and the presence of SSCD was determined by consensus. The rate of concurrent disease was established and descriptive statistics demonstrated. **Results:** After review of patient records, 373 patients (663 ears) had radiographic evidence of otosclerosis and met minimum technical inclusion criteria. Definitive concurrent SSCD occurred in 18 patients (4.8%). Possible/equivocal radiographic dehiscence occurred in 13 patients (3.5%). Only 2 patients with possible dehiscence did not have oblique reconstructions available for review. **Conclusions:** Concurrent SSCD in patients with otosclerosis has well described clinical implications and radiographically occurs at a rate of at least 4.8%. Historically, negative findings at reexploration in failed stapes surgery occurs approximately 3.5%, of which may be partially due to concurrent disease.

Pediatric Otolaryngology

112. Workplace Ergonomics in Pediatric Otolaryngology

Nicole Leigh Aaronson, MD MBA, Wilmington, DE; James S. Reilly, MD, Wilmington, DE

Educational Objective: At the conclusion of this presentation, the participants should be able to understand surgeon positioning preferences in pediatric otolaryngology, how preferences have been formed, and whether positioning preferences have been associated with surgeon injury.

Objectives: This study reports the ergonomics norms for common operating rooms in pediatric otolaryngology. It seeks to identify when surgeon preferences and practices become norms and whether procedure positions are associated with surgeon injury. **Study Design:** Survey study. **Methods:** A 23 question survey was created addressing preferences for "sitting vs standing" and "operating room bed vs transport stretcher" for seven pediatric otolaryngology procedures. We included demographic information, reasons for preferences, and surgeon reported pain. Surveys were distributed through the American Academy of Pediatrics Section on Otolaryngology-Head and Neck Surgery. **Results:** Sixty-nine (69) participants completed the survey. 90% of pediatric otolaryngologists sit for the majority (4/7) of common surgeries (bilateral myringotomy with tubes, myringoplasty, direct laryngoscopy and bronchoscopy, and tonsillectomy and adenoidectomy procedures. However, a reverse majority stand for thyroglossal duct cyst excision, removal of nasal foreign body, and drainage of neck abscess procedures. Residency training (75%) and personal comfort (81%) were the more frequently cited reasons for preference. Fewer than one in five (16%) reported preexisting neck or back pain, but this doubled (35%) over the course of their otolaryngology practice. Conditional distributions of pain showed reports of pain were greater for

individuals in practice for over 20 years. However, correlation based on surgeon height was not found. **Conclusions:** Pediatric otolaryngologists develop their operating room preferences based mostly on prior residency training. High rates of neck and back pain (35%) may develop during a surgeon's career. We suggest improved understanding of ergonomic practices should be considered during otolaryngology residency training since recent data suggest potential benefits of standing on cognitive function.

113. Is Adenoidectomy and Myringotomy Sufficient to Control Otitis Media with Effusion in Children: A Retrospective Review of Effectiveness

Ezer Haim Benaim, BA, Memphis, TN; Michael J. Herr, PhD, Memphis, TN; Madhu Mamidala, PhD, Memphis, TN; Anthony Sheyn, MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the possible indications and effectiveness of adenoidectomy and myringotomy without tube insertion (AMWT) for otitis media with effusion.

Objectives: Otitis media with effusion (OME) is the leading cause of hearing loss in children. The objective of this study is to determine if adenoidectomy and myringotomy without tube insertion (AMWT) is sufficient to control OME. **Study Design:** Retrospective review was conducted on patients that received AMWT from 2018-2019 for treatment of otitis media with effusion. **Methods:** Both preoperative and postoperative audiograms and tympanograms were analyzed to evaluate changes following AMWT. Additionally, further need for pressure equalizing tubes (PETs) and residual hearing loss were recorded as secondary outcomes. **Results:** Fifteen patients met inclusion criteria. There was no statistical difference in the pre and postoperative tympanogram scores in the right and left ears. However, there was a more substantial decrease in the pure tone average (PTA) in the right ear versus the left ear. The total improvement in PTA (right and left ear audiograms combined) in patients with history of PET was 6.07 ± 7.00 and without prior surgery was 0.31 ± 12.90 (P=0.1480) which also indicates that patients with prior surgery had better outcomes. Although not statistically significant, six of the fifteen patients (40%) reported no further symptoms, while seven patients (47%) received PETs after no improvement was noticed on followup. **Conclusions:** Placement of PETs for OME continues to be an effective treatment. However, several complications exist in association with PET that do not occur with simple myringotomy and adenoidectomy. This study has shown that avoidance of PET and performing AWMT only is an effective long term strategy for some patients.

114. Congenital Rhabdomyosarcoma in a 5 Hour Old Newborn: A Case Report and Report of the Literature

Elizabeth A. Borowiec, BS, Washington, DC; Stephanie Y. Johng, MS, Washington, DC; Earl H. Harley, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to better characterize and diagnose congenital rhabdomyosarcoma in a newborn.

Objectives: To characterize the difficult diagnostic process and treatment for a neonate presenting with extensive rhabdomyosarcoma leading to airway obstruction at the level of the oropharynx. **Study Design:** Case report and review of the literature. **Methods:** After consulting on this patient, a review of the literature was performed pertaining to diagnostic process and treatment modalities for neonatal rhabdomyosarcoma of the upper airway tract. **Results:** Otolaryngology was consulted on a 5 hour old infant presenting with a left buccal mass and tongue deviation to the right. Imaging revealed the mass extended into the retropharyngeal, parapharyngeal, parotid and masticator spaces, facial subcutaneous layer, and lip with tongue deviation and rightward deviation and narrowing of the airway at the level of the oropharynx. The patient was intubated due to concern for mass expansion. Definitive diagnosis was challenging as several biopsy attempts were inconclusive. Differential diagnosis included infantile fibrosarcoma, myofibroma, infantile myofibromatosis, and various spindle cell neoplasms. After further clinicopathologic correlation, a diagnosis of well differentiated spindle cell rhabdomyosarcoma was reached, based on desmin positive and myogenic positive immunohistochemistry. Staged at stage 1, T1a, N0, M0 and deemed group 3 (non-resectable), the patient was enrolled in Children's Oncology Group (COG) ARST1431 clinical trial. **Conclusions:** While rhabdomyosarcoma is the most common soft tissue cancer found in childhood, neonatal presentation is incredibly rare. With the paucity of literature on this subset of patients and difficulty in reaching a definitive diagnosis, we report the presentation, characteristics, and treatment regimen of congenital rhabdomyosarcoma in a 5 hour old infant.

115. Online Perception and Ratings of Pediatric Otolaryngologists

Janice T. Chua, BS, Irvine, CA; Emily Nguyen, BS, Irvine, CA; Ariel Lee, BS, Irvine, CA; Brooke Sarna, BS, Irvine, CA; Adwight Risbud, BS, Irvine, CA; Mehdi Abouzari, MD PhD, Orange, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the impact of comments provided by patients in online platforms on their ratings and practice success.

Objectives: To assess and characterize online ratings and comments of pediatric otolaryngologists and determine factors that correlate with higher ratings. **Study Design:** Database analysis. **Methods:** All the American Society of Pediatric Otolaryngology (ASPO) members were queried on Healthgrades, Vitals, RateMDs, and Yelp until June 2019. Ratings were normalized for comparison on a five point Likert scale. All comments were categorized based on context and for positive/negative aspect. **Results:** Of the 561 ASPO members, 489 (87%) were rated on at least one online platform. Of those rated, 410 (84%) were on Healthgrades, 429 (88%) on Vitals, 236 (48%) on RateMDs, and 72 (15%) on Yelp. Across all platforms, the average overall rating was 4.13 ± 0.03 (range: 1.00-5.00). There were significant positive correlations between overall rating and specific ratings ($p<0.001$) on all individual topics. Categorizing 3,504 narrative comments demonstrated the majority to be related to perceived physician bedside manner and clinical outcome, with the associated negative comments correlating (negatively) with the overall score ($p<0.05$). Time spent with the physician was the only category in which both positive and negative comments showed significant correlation with the overall physician rating ($p=0.016$ and $p=0.017$, respectively). **Conclusions:** Online ratings and comments for pediatric otolaryngologists are highly dependent on patient and parent perceptions of physician competence, comforting bedside manner, and office and time management. Minimizing the number of negative comments, especially regarding perceived physician bedside manner, clinical outcome, and time spent with the physician, and maximizing the number of positive comments related to time spent with the physician, leads to higher overall scores and online perception.

116. Congenital Median Upper Lip Sinus: Three Examples of a Rare Anomaly

Emily K. Gall, MD, Boston, MA; Andrew R. Scott, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the embryology of congenital median upper lip sinus and to describe the ideal workup and optimal management of a median upper lip tract in an otherwise healthy child.

Objectives: To describe the presentation and management of three cases of congenital midline upper lip sinus; to suggest a contemporary strategy for imaging and surgical intervention based on review of the current literature. **Study Design:** Retrospective case series and literature review. **Methods:** The case database of a tertiary pediatric otolaryngology practice was queried to identify cases of isolated midline sinus tract within the philtral subunit of the upper lip. A chart review was performed and a literature review was conducted. **Results:** Three children with isolated congenital midline upper lip sinus were identified. The ages at presentation included one infant, a toddler, and an older child. The two older patients underwent excision of the tract without complication. The youngest child was encouraged to defer intervention until later in infancy or early childhood. The embryology of upper lip sinuses is reviewed and a discussion of optimal evaluation and management of this entity is presented. **Conclusions:** Congenital midline upper lip sinus is a rare anomaly. The embryologic origin of this entity does not suggest a connection to the central nervous system; in most cases, preoperative imaging is unnecessary. Simple excision with meticulous closure may yield a favorable aesthetic result.

117. Unilateral Vocal Fold Paralysis following Pediatric Thyroidectomy

Stephanie M. Horton, BM, Memphis, TN; Anthony Sheyn, MD, Memphis, TN; Regan Williams, MD MS, Memphis, TN; Sara Mansfield, MD, Memphis, TN; Bailey Lyttle, BA MD, Memphis, TN; Reagan Mead, BA, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be more informed about the occurrence of UVFP following pediatric thyroidectomies, as well as be aware of the need for further research into the risk factors that may lead to postoperative UVFP in children, as these have yet to be identified.

Objectives: Thyroid surgeries continue to be the leading cause of iatrogenic unilateral vocal fold paralysis (UVFP) in children. While recurrent laryngeal nerve injury leading to vocal fold paralysis has been investigated in adult populations, there is not a significant amount of discussion in the literature on post-thyroidectomy UVFP in pediatric patients. Our study aimed to investigate potential risk factors for post-thyroidectomy UVFP in the pediatric population. **Study Design:** Retrospective chart review using data from 2 institutions. **Methods:** IRB approval was obtained for a retrospective chart review. Patients were reviewed from 2002-2018. 125 patients were identified and underwent chart review. Demographic data including race, sex, BMI, and number of previous surgeries and indications were reviewed to evaluate for risk factors. Statistical analysis was then performed using a paired t-test. P-value was set at < 0.05. **Results:** 125 patients were identified and had their charts reviewed. The majority underwent intraoperative nerve monitoring (111/125). FFL was performed on 44/125 patients postoperatively. 16 patients were identified to have hoarseness postoperatively; 12/16 underwent postoperative FFL, with 5 having documented UVFP. Of the individuals diagnosed with postoperative UVFP, 4 were female and 1 was male. 4/5 patients did not have previous surgeries. 4/5 patients had a BMI >20. On paired t-test analysis of the variables race, sex, BMI, and number of previous surgeries, no factors appeared to be statistically significant. **Conclusions:** In this study 4/5 patients were identified to have UVFP. No factors appeared to be predictive of which patients

were at risk. Additional patients and a multi-institutional are needed to determine whether there are factors that can predict which patients are at risk for UVFP after pediatric thyroidectomy.

118. Respiratory Complications after Tonsillectomy and Its Association among Black Children

Jorena Lim, BS, Dallas, TX; Priya Garigipati, BA, Dallas, TX; Katie A. Liu, MD, Dallas, TX; Romaine F. Johnson, MD MPH, Dallas, TX; Ron B. Mitchell, MD, Dallas, TX; Christopher Liu, MD, Dallas, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to identify risk factors for postoperative respiratory complications after tonsillectomy among high risk patients.

Objectives: To explore the etiologies for racial disparities of postoperative respiratory complications after pediatric tonsillectomy. **Study Design:** Retrospective case series. **Methods:** We conducted a retrospective analysis of children < 18 years of age with polysomnography confirmed severe obstructive sleep apnea (apnea-hypopnea index > 10) for postoperative respiratory complications after tonsillectomy. Demographic, clinical, and polysomnographic data were collected. Patients were analyzed for respiratory complications and whether racial/ethnic disparities were present and which potential confounders were responsible. We determined the odds ratio for respiratory events using logistic regression. **Results:** From January 2019 to December 2019, 449 children with severe obstructive sleep apnea underwent tonsillectomy, of whom 78 (17%) were white, 118 (27%) were Black, 223 (50%) Hispanic, and 30 (6.7%) other. The median age was 5.6 years (interquartile range 3.2 to 8.9); 270 (60%) were male. Forty-eight children (11%) had a respiratory complication post-tonsillectomy. Black children had more respiratory events than other children (16% vs. 8.8%, P = .03, OR = 2.00 [95% CI = 1.07 - 3.72]). The most important predictor of respiratory events was desaturations (% time SpO2 < 90%) on polysomnography (OR = 1.05, 95% CI = 1.03 to 1.07). Children with events spent 13.5% (95% CI = 10.2 - 16.9) more time below 90% than those who did not have a respiratory event. Further analysis of the data suggested that the effects of asthma played an important role in risk modulation. **Conclusions:** Respiratory complications after tonsillectomy among high risk children are predicted by the percentage of sleep time the SpO2 is below 90%. Black children are at higher risk for events, and asthma is an important comorbidity for further study.

119. Weight Gain and Severe Obstructive Sleep Apnea in Adolescents with Down Syndrome

Rachel Manuel, BA, Dallas, TX; Gopi B. Shah, MD MPH, Dallas, TX; Ron B. Mitchell, MD, Dallas, TX; Romaine F. Johnson, MD MPH, Dallas, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the effect of weight gain on obstructive sleep apnea severity in adolescents with Down syndrome.

Objectives: To determine whether the severity of obstructive sleep apnea (OSA) is affected by weight gain velocity in adolescents with Down syndrome. **Study Design:** Retrospective case series. **Methods:** Children with Down syndrome, ages 9-19, referred for polysomnography (PSG) due to suspected OSA were analyzed. We determined the velocity (slope of change) of yearly weight gain using a mixed effect linear regression model. Subsequently, we determined if velocity of yearly weight gain was greater in adolescents with severe OSA (AHI > 10). **Results:** A total of 77 adolescents with Down syndrome were identified. The average age was 12.5 years (SD = 3.1); 44 (57%) were male and 46 (60%) were Hispanic. The majority, 51 (66%) had severe OSA. The velocity of yearly weight gain prior to PSG in Down syndrome adolescents was similar regardless of OSA severity (mean diff in weight gain at PSG = -1.42, 95% CI = -5.8 to 2.9, P = .52). Those with severe OSA did weigh more at PSG (40.9 kg vs. 58.4 kg, P < .001) and all years prior to PSG. These findings remained even when controlling for age at PSG. **Conclusions:** Severe OSA in adolescents with Down syndrome may be associated with absolute weight. There was no significant difference in weight gain velocity in children with DS with or without severe OSA.

120. Perinatal Risk Factors Associated with Airway Intervention in Fetal Micrognathia

Madeline Paige Pyle, BA, Milwaukee, WI; Marc Anthony Drake, MD, Milwaukee, WI; Jaclyn Gellings, MD, Milwaukee, WI; Michael R. Uhing, MD, Milwaukee, WI; Erika L. Peterson, MD, Milwaukee, WI; Robert H. Chun, MD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should be able to ascertain what risk factors are associated with perinatal airway obstruction and the need for airway intervention in a population diagnosed with prenatal micrognathia.

Objectives: Prenatal diagnosis of fetal micrognathia (FM) is associated with perinatal airway obstruction (PAO). We sought to determine risk factors associated with PAO and need for airway intervention in FM. **Study Design:** Retrospective chart review. **Methods:** A cohort of 58 FM patients was identified (2008-2018). Delivery room interventions (DRI) were defined as need for CPAP, laryngeal mask airway, intubation, or tracheostomy. Airway intervention within 24 hours (A24) was defined as intubation or tracheostomy within 24 hours of delivery. No ex utero intrapartum treatments were performed.

Results: All 6 cases of maternal polyhydramnios required DRI (p<0.001) and 4 of 6 required continued A24 (p=0.007). 1 minute APGAR (mean 4.2 SD 2.5) and 5 minute APGAR (mean 6.4 SD 2.1) were associated with DRI (p<0.001), and 1 minute APGAR (mean 3.4 SD 2.6) and 5 minute APGAR (mean 5.6 SD 3.5) were associated with mortality (p=0.004 and p=0.009, respectively). Lower inferior facial angle (IFA) (mean 48.5 SD 8.1) was associated with DRI (p=0.011). 4 out of 11 fetal MRI's (36.4%) required A24 (p=0.035), and all MRI's demonstrated a continuous upper and lower airway. Lower birthweight (mean 1936.7g SD 900) was associated with mortality (p=0.002). 35% of DRI (7/20) required continued A24 (p=0.002). 34% of 58 FM patients needed DRI, but at 24 hours only 13% required ventilation or tracheotomy. **Conclusions:** Low initial APGAR, polyhydramnios, lower IFA, were associated with a need for DRI and A24, and low birthweight and poor APGAR were associated with increased mortality. Approximately a third of FM children will need DRI but only 13% will need A24.

121. Laryngeal Clefts in Children with CHARGE Syndrome

Sarah E. Ridge, BA, Cincinnati, OH; Sonia N. Yuen, MD, Cincinnati, OH; Alessandro deAlarcon, MD, Cincinnati, OH; Catherine K. Hart, MD, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the characteristics of laryngeal clefts in patients with CHARGE syndrome.

Objectives: Describe laryngeal clefts and associated swallowing dysfunction in patients with CHARGE syndrome. **Study Design:** Retrospective case series. **Methods:** Patients with CHARGE syndrome evaluated at a single tertiary pediatric institution between July 2017 and December 2019 were included, as well as those in the hospital's laryngeal cleft database from 2016 through 2019. Medical records were reviewed for demographic information, instrumental evaluation of swallowing function, type of laryngeal cleft and operative intervention. **Results:** Twenty-nine patients with CHARGE syndrome underwent airway evaluation during the study period. Fourteen were diagnosed with a laryngeal cleft (48%). Of these patients, 7 had a deep interarytenoid notch, 5 had a type I cleft, and 2 had a type II cleft. The median age at diagnosis was 3 years, with a range of 10 months to 15 years old. Four had a tracheostomy, and 12 had a gastrostomy tube. Thirteen patients had a preoperative fiberoptic endoscopic evaluation of swallowing (FEES) or a videofluoroscopic swallow study (VSS), with laryngeal penetration observed in 12 patients and aspiration observed in 10 patients. Twelve patients underwent surgical repair. Five patients had a postoperative FEES or VSS, with 4 showing improvement in aspiration and/or penetration. Followup ranged from 0 months to 5 years, with a median of 8 months. **Conclusions:** A laryngeal cleft was found in nearly half of patients with CHARGE syndrome undergoing airway evaluation. Abnormal swallowing function was found in the majority of these children. As such, airway endoscopy should be considered in CHARGE patients with swallowing dysfunction.

122. Association of Extraesophageal Reflux with Effusion Viscosity in Pediatric Otitis Media

Tina Samuels, MS, Milwaukee, WI; Mana Espahbodi, MD, Milwaukee, WI; Robert H. Chun, MD, Milwaukee, WI; Michael E. McCormick, MD, Milwaukee, WI; Joseph E. Kerschner, MD, Milwaukee, WI; Nikki Johnston, PhD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should better understand the contribution of extraesophageal reflux to pediatric otitis media.

Objectives: Otitis media (OM) is a middle ear (ME) inflammatory disease spectrum that affects 75% of children by age three. Persistent ME effusion resultant from recurrent and chronic OM can have serious implications including conductive hearing loss leading to developmental delays. Interleukin-8 (IL-8) signaling and related neutrophil activity contribute to viscous effusions during OM. Extraesophageal reflux, indicated by pepsin in the ME, has been implicated in inflammatory signaling during OM. The objective of this study was to investigate the association of pepsin in the ME with IL-8 and hearing loss in recurrent and chronic pediatric OM patients. **Study Design:** Cross-sectional. **Methods:** ME effusion and preoperative audiometric data was collected from 30 subjects aged 6 months to 12 years undergoing tympanostomy tube placement for recurrent OM or OM with effusion. Effusion viscosity was characterized by the surgeon using a 6 point scale. Pepsin and IL-8 were assayed by ELISA. **Results:** Pepsin in effusion was observed in 77% (23/30) patients. Pepsin correlated with effusion viscosity (p<0.05) but not IL-8 or hearing loss. Repeat surgery was required in 39% (9/23) pepsin positive cases, and 0% (0/7) pepsin negative cases. **Conclusions:** Extraesophageal reflux may contribute to persisting, viscous effusion during OM and need for repeated surgical intervention. Work is ongoing to examine the association of ME pepsin with mucin 5B, a marker of effusion viscosity, as well as the direct role of pepsin in inflammatory signaling and mucin overproduction in ME epithelial cells in vitro.

123. Frenotomy Practice in Pediatric Patients with Ankyloglossia

Barcleigh Sandvall, MD, Oakland, CA; Sanidhya Dhir, North Chicago, IL (Presenter); Stefan Edemobi, Norfolk, VA; Anna K. Meyer, MD, San Francisco, CA; Megan Durr, MD, Oakland, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that there is an increased number of frenotomy referrals, indications for frenotomies are variable and there is a need for multi-institutional studies to help determine best practices.

Objectives: To assess the current practice patterns of pediatric otolaryngologists on frenotomy procedures. **Study Design:** Cross-sectional survey. **Methods:** A 31 question electronic survey was designed to understand the current frenotomy practice patterns of pediatric otolaryngologists. Descriptive statistics were used to summarize responses and demographics of survey respondents. **Results:** Forty percent (240/588) of ASPO members in academic (76%), private (22%) and HMO (2%) practices completed the survey. Respondents (85%) observed increased frenotomy referrals over the last 5 years. The following indications identified infants for lingual frenotomy: breastfeeding/nipple pain (94%), inability to latch (85%), shallow latch (59%), poor infant weight gain (59%) or falling off breast/need to frequently latch (58%). For an older child, speech articulation difficulties (90%) was the primary indication. Indications for maxillary frenotomy on an infant varied among respondents: upper lip will not flange (49%), upper lip inverts with latch (43.5%), breastfeeding/nipple pain (40%), inability to latch (40%), no indication (25%). For older children, maxillary incisor diastema (54%) was the primary indication. Complications included: no complications (45%), frenulum reattachment (33%), or excessive bleeding (26%). **Conclusions:** Pediatric otolaryngologists have identified a significant increase in frenotomy referrals over the past 5 years. The practice patterns identified in this survey align with a recently published clinical consensus statement. Studies support frenotomy for ankyloglossia, while no studies support upper lip frenotomy for breastfeeding and an increasing number of providers are performing this procedure with considerable variation in terms of indications. While adverse events are rare, multi-institutional studies should be considered to help determine best practices.

124. A Retrospective Review of Risk Factors for Replacement of Ear Tubes after Surgical Removal for Pediatric Patients

Shalini Shah, BA, Rochester, NY; Bartholomew Bacak, MD, Rochester, NY; Margo McKenna Benoit, MD, Rochester, NY; John Faria, MD, Rochester, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to identify risk factors for replacement of ear tubes in pediatric patient who underwent tube removal and myringoplasty.

Objectives: Ear tube removal and patch myringoplasty is frequently performed in pediatric patients. The indication for surgery varies among pediatric otolaryngologists. This study identifies risk factors affecting the need for revision tube replacement after myringoplasty. **Study Design:** Retrospective chart review and case series. **Methods:** Patients less than 12 years of age who underwent tympanostomy tube removal and myringoplasty at a tertiary care academic medical center from March 2011 to September 2019 were eligible for inclusion. Patients who had tympanostomy tube removal due to chronic otorrhea were excluded. **Results:** 203 unique patients and 301 ears were included in this study. Thirty ears required revision tube placement after myringoplasty (RTM) and 271 did not. RTM was performed in 12/98 (12.2%) of patients with bilateral myringoplasty vs. 6/105 (5.7%) unilateral myringoplasty. The median (IQR) duration between initial tube placement and myringoplasty for RTM patients was 27 (10) vs. 30 (14) months in non-RTM patients ($p=0.024$). Nine patients had a history of cleft palate and accounted for 7 of the 30 ears requiring RTM (Cramer's $V=0.295$, $p<0.001$). RTM patients had more lifetime tube placements than the non-RTM group (Cramer's $V=0.169$, $p=0.02$). **Conclusions:** Time between initial tube placement and myringoplasty was significantly shorter in patient's requiring RTM. History of cleft palate and multiple prior tube placements were moderately and weakly predictive of RTM, respectively. Delaying myringoplasty may reduce the need for RTM, particularly in children who have had multiple tubes placed or a history of cleft palate.

125. Reoperative Rates in Pediatric Patients Who Underwent Mastoidectomy for Acute Coalescent Mastoiditis

Dhruv Sharma, MD, Indianapolis, IN; Brady J. Tucker, BS, Indianapolis, IN; Cole Rodman, MD, Indianapolis, IN; William E. Bennett, MD, Indianapolis, IN; Sarah J. Burgin, MD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand that a significant proportion of pediatric patients who previously underwent mastoidectomy for acute coalescent mastoiditis will require a future ear operation; 2) state which pediatric patients are more likely to require future pressure equalization tube placement and major otologic surgery; and 3) know the reasons why patients required future major otologic surgery.

Objectives: To investigate reoperative rates of otologic procedures in pediatric patients who underwent mastoidectomy for acute coalescent mastoiditis. **Study Design:** A retrospective cohort study. **Methods:** 49 patients who underwent 50 mastoidectomy operations at a tertiary children's hospital from 2009 to 2019 were identified using the Pediatric Health Information System database. Demographic and clinical data were collected from the electronic medical record. Statistical analysis was performed in Statistical Package for Social Sciences. **Results:** The mean age at presentation was 5.5 years (range: 0.1 to 15.7), and there was a slight male predominance (1.4:1). 34.1% (15/44) of available cultures collected during

surgery from the mastoid cavity were negative for bacterial growth. 26.5% (13/49) of patients required future pressure equalization tube (PET) placement, and this cohort was more likely to have had negative cultures at the time of mastoidectomy (p = .0164). 16.3% (8/49) required future major otologic surgery (MOS), and this cohort had a statistically significant difference in age with a mean age of 8.6 years (range: 1.5 to 15.7) compared to 4.9 years (range: 0.1 to 13.9) in patients who did not have MOS (p =.0236). The future MOS cohort was also more likely to have had prior ear surgery (p = .0006) and not have had prior PET (p = .0167). Reasons for future MOS included: hearing loss (5/8), tympanic membrane perforation (3/8), otorrhea (1/8), cholesteatoma (2/8), recurrent mastoiditis (2/8), and postauricular fistula (1/8). **Conclusions:** A significant proportion of pediatric patients who undergo mastoidectomy for AM require a future ear procedure.

126. Eagle Syndrome in the Pediatric Population: A Case Report

Zachary G. Tanenbaum, MS, Washington, DC; Stephanie Y. Johng, MS, Washington, DC; Keon M. Parsa, MD, Washington, DC; Mark E. Russo, MD, Washington, DC; Earl H. Harley, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to keep Eagle syndrome in their differential within the pediatric population.

Objectives: To present a rare case of Eagle syndrome in a pediatric patient. **Study Design:** Case report and review of the literature. **Methods:** After this patient was seen in our clinic, a review of the literature was performed by for literature pertaining to Eagle syndrome within the pediatric population. **Results:** A 10 year old female with a history of mild obstructive sleep apnea status post adenotonsillectomy three years ago presented to our clinic with complaints of intermittent throat pain and globus sensation. Since surgery, she had recurrent bouts of symptoms that were consistently streptococcal negative. The patient denied her symptoms were temporally associated with coughing or congestion and noted that the pain began after her adenotonsillectomy. Her exam was notable for tenderness with palpation of the left tonsillar fossa area. A computed tomography revealed bilateral elongated styloid processes measuring 2.4 cm on the right and 2.5 cm on the left (normal length 2.3 cm), consistent with Eagle syndrome. The patient underwent endoscopy assisted transoral excision of the left styloid process. The patient reported complete resolution of all symptoms, including jaw pain, during her postoperative visit. **Conclusions:** Though infrequent in the pediatric population, Eagle syndrome should still remain on the differential when children status post tonsillectomy present with symptomatic craniofacial neuralgia.

127. Helping Children with Special Needs: Who Receives Tympanostomy Tubes?

David W. Wassef, BS, Newark, NJ; Nehal Dhaduk, BS, Newark, NJ; Savannah Roy, BS, Newark, NJ; Gregory L. Barinsky, PharmD, Newark, NJ; Evelyne Kalyoussef, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the different epidemiological and clinical characteristics in children with diagnosed developmental disorders receiving myringotomy and tympanostomy tubes when compared to the general population of children.

Objectives: Tympanostomy tubes can prevent sequelae of otitis media that adversely affect long term hearing and language development in children. These negative outcomes compound the existing difficulties faced by children who are already diagnosed with developmental disorders. This study aims to characterize this subset of children with developmental disorders undergoing tympanostomy tube insertion. **Study Design:** Retrospective analysis of the Kids' Inpatient Database (KID). **Methods:** The KID was queried from the years 2003-2012 using International Classification of Diseases, Ninth Revision (ICD-9) codes to identify a study group of children with a diagnosis of a developmental disorder undergoing myringotomy and tympanostomy insertion. This group was statistically compared to patients undergoing these procedures who did not have a diagnosed developmental disorder. **Results:** In total, 21,945 cases of patients with myringotomy with or without tympanostomy tube insertion were identified, of which 1200 (5.5%) had a diagnosis of a developmental disorder. Children with developmental disorders had a higher mean age (3.3 years vs. 2.9 years, p=0.002) and higher mean hospital charges ($43,704.77 vs $32,764.22, p=0.003). This cohort also had higher proportions of Black (17.6% vs. 12.3%, p<0.001) and Hispanic (23.9% vs. 20.6%, p=0.014) patients and had lower rates of private insurance coverage (39.6% vs. 49%, p<0.001). **Conclusions:** The population of children with developmental disorders undergoing myringotomy or tympanostomy has a different demographic composition than the general population and faces distinct financial and insurance coverage burdens. Further study should be done to assess if these differences impact long term outcomes.

128. The Impact of HPV Vaccination in Treatment of Severe Juvenile Onset Recurrent Respiratory Papillomatosis

Michelle K. White, MD, Boston, MA; Mark Vecchiotti, MD, Boston, MA; Andrew Scott, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, participants should appreciate HPV vaccination as a low cost option for adjuvant therapy in juvenile onset recurrent respiratory papillomatosis (JoRRP) that does not require general anesthesia. The therapeutic and preventative effects of HPV vaccination in treatment of severe JoRRP will be discussed. Furthermore, data is emerging that vaccinating mothers with RRP has the potential to eradicate JoRRP.

Objectives: Recurrent respiratory papillomatosis (RRP) is the most common benign laryngeal neoplasm in children. Surgery is mainstay of treatment with adjuvant therapy indicated in more severe cases. HPV vaccination has been shown to be an effective adjuvant therapy for adult onset RRP, however safety and efficacy in the pediatric population has only been described in case reports. **Study Design:** This is the case of a 2 year old female from Haiti with juvenile onset RRP (JoRRP) and tracheostomy presenting in extremis with aphonia and dyspnea, found to have extensive obstructive glottic and tracheal papillomatosis. **Methods:** Initial treatment included surgical debulking and Gardasil 9 HPV vaccination. Over the next 20 months, she made return trips from Haiti and underwent four minor surgical procedures and received a second dose of Gardasil 9. **Results:** At recent office visit four months postop, she is phonating and endoscopy revealed patent glottic and tracheal airways with no evidence of residual papilloma. **Conclusions:** Despite its off label use, HPV vaccination contributed to improving this patient's prognosis from palliative at presentation to no evidence of papilloma currently. While other adjuvant therapy options for JoRRP are often costly and require general anesthesia, vaccine administration is low cost and does not require the operating room. HPV vaccination is an effective and practical treatment option for children with JoRRP, particularly in children with limited access to healthcare both in the United States and the developing world.

129. Tracheostomy Outcomes and Patient Characteristics in Children with Down Syndrome

Yunjia Zhang, MS, Syracuse, NY; Jacob Mesches, MD, Syracuse, NY; Brian Nicholas, MD, Syracuse, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the patient characteristics and tracheostomy outcomes in children with Down syndrome in comparison to children without Down syndrome.

Objectives: The objective of this study is to investigate the patient characteristics and outcomes of tracheostomy in children with Down syndrome compared to children without Down syndrome. **Study Design:** Retrospective data analysis. **Methods:** Pediatric inpatient data was analyzed using the 2000 to 2012 Kids' Inpatient Database (KID). Independent t test, chi square test, linear regression analysis, and binary logistic regression analysis were used to compare outcomes of tracheostomy in children with Down syndrome to those without Down syndrome. Binary logistic regression analysis was performed to predict patient characteristics of children with Down syndrome and children without Down syndrome. **Results:** From 2000 to 2012, there were 22419 admissions with tracheostomy, including 370 cases with Down syndrome, 22046 cases without Down syndrome, and 2 cases missing a diagnosis. On average, children with Down syndrome were significantly younger in age (3.74 years old vs. 7.62 years old, p=0.000), stayed in the hospital longer (61.56 days vs. 53.94 days, p = 0.011), and had a higher rate of mortality during hospitalization (9.70% vs. 7.00%, p = 0.045). Linear regression indicated a negative correlation between patients' length of stay and age (p = 0.000). Significant predictors for patients with Down syndrome included younger age (odds ratio [OR]: 0.92, 95% confidence interval [CI]: 0.904-0.937), black race vs white race (OR 1.406, CI 1.044-1.892), and female gender (OR 1.251, CI 1.009-1.551). **Conclusions:** Among hospitalized children who underwent tracheostomy placement, children with Down syndrome were associated with younger age, longer hospital stay, and a higher rate of mortality during hospitalization. Patients with Down syndrome were significantly more likely to be younger, black, and female.