



# Abstract Session Information

**SENTAC and the  
Aerodigestive Society  
Combined 2020  
Virtual Meeting**

Friday and Saturday,  
December 4th–5th, 2020



## Combined 2020 Virtual Meeting Abstract Session Information

### Abstract Session 1

December 4<sup>th</sup> 10:00am CST

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#### Title of Paper

Velopharyngeal Insufficiency in 22q11 Deletion Syndrome Patients: An Assessment of Nasal Endoscopy and Speech Evaluation Findings

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#### Abstract

**Background:** 22qDS presentation is heterogeneous with varying phenotypes. Incidence of velopharyngeal insufficiency (VPI) is common in 22qDS, ranging from 32% to 90%. The Golding-Kushner scale has been used since 1990 to grade nasal endoscopy findings, but there is no clear correlation between nasal endoscopy findings and speech assessment measures in VPI.

**Methods:** A retrospective chart review was conducted of pediatric patients presenting to the VPI clinic at an urban, quaternary care children's hospital between 2010-2019. Pre-operative and post-operative speech evaluation and physical exam findings were assessed. Our unique grading scale was used to quantitatively score these exams.

**Results:** The average age at VPI surgery was  $86.7 \pm 40.4$  months. Five (16.7%) patients had large gap pre-operatively, and none in the post-surgical group. Pre-operative intelligibility was  $69 \pm 20\%$  for dynamic sphincter pharyngoplasty and  $57 \pm 20\%$  for pharyngeal flap. This improved to  $82 \pm 32\%$  for dynamic sphincter pharyngoplasty and  $76.6 \pm 25.9\%$  for pharyngeal flap post-operatively. The Pearson correlation coefficient (PCC) between intelligibility and AP velum movement was 0.40 pre-operatively and 0.80 post-operatively. When evaluating intelligibility and size of velopharyngeal gap, the PCC was -0.52 before surgery and 0.07 after surgery.

**Conclusion:** Intelligibility improved post-operatively in patients undergoing both dynamic sphincter pharyngoplasty and pharyngeal flap. The greatest association post-operatively is between intelligibility and AP velum movement. Velopharyngeal gap size and intelligibility have the greatest correlation in the pre-operative setting. Both measures correlate nasal endoscopy findings to speech evaluation, which may help provide more accurate prognostic information and improve care.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Disparities in completing testing for SARS-CoV-2 prior to otolaryngology procedures

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### Abstract

**Purpose:** to determine what patient characteristics are associated with completing asymptomatic pre-operative testing for SARS-CoV-2.

**Methods:** Charts from consecutive patients undergoing ambulatory surgery in otolaryngology at a tertiary care children's hospital from May 4 until May 26, 2020 were reviewed. If two or more siblings were scheduled, only the first sibling was included. Demographics, surgical details, and results of asymptomatic pre-operative testing for SARS-CoV-2 were collected. Patients who completed preoperative testing were compared with those who did not using logistic regression or Wilcoxon rank-sum tests,  $\alpha = 0.05$ .

**Results:** 216 patients were included. 40.4% were female, and median age at surgery was 2 years (range 4 months--20 years). 88 patients (40.7%) had pre-operative SARS-CoV-2 RT-PCR testing. 97.7% of sampling occurred 2-3 days prior to the procedure, and 98.9% of results were available within 2 days. The virus was not detected in any cases. In multiple logistic regression, undergoing surgery at the main hospital location rather than a satellite location (OR: 3.13,  $p=0.003$ ) and greater median household income for zip (OR: 1.18/\$10,000,  $p=0.042$ ) were associated with completing pre-operative testing. However, race, insurance type, surgeon, patient age, previous no-show appointments, and household composition did not alter the odds of completing pre-operative testing.

**Conclusions:** Families were less likely to complete testing if surgery was being performed at a satellite location or if they lived in an area with lesser median household income. Future work will examine whether these patterns changed over the following months as the number of surgeries and testing locations increased.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Risks and Benefits of Adenotonsillectomy in Children with Cerebral Palsy: A Systematic Review

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### Abstract

**Background:** Cerebral palsy (CP) occurs in 1 in 500 live births. Obstructive sleep apnea (OSA) is a common and challenging comorbidity in children with CP. Adenotonsillectomy is the preferred initial treatment. Additional comorbidities and the multifactorial nature of OSA in children with CP put patients at risk of complications and treatment failure. Specific information regarding the risks and benefits of adenotonsillectomy in children with CP is required.

**Methods:** We conducted a systematic review of Medline, Embase, and Cochrane Central Registry from 1946-2020. Broad search concepts included: cerebral palsy terms, pediatric terms, tonsillectomy/adenoidectomy terms, and sleep terms. Additional articles were identified by searching the reference lists.

**Results:** Twenty articles met inclusion criteria. Articles were classified into 4 themes: intra-operative risk (n=2), post-operative complications (n=3), post-operative care needs (n=7) and treatment response (n=8). No intraoperative anesthetic complications were reported. Post-operatively, respiratory complications were common including pneumonia and need for additional airway management. Children with CP required prolonged post-operative observation and commonly experienced unplanned ICU admission and increased length of stay. Benefits included reducing AHI and improved patient and parent quality of life. Additional treatments were required in 24% of children, including uvulopalatopharyngoplasty, supraglottoplasty and tracheostomy. 19-64% of patients required tracheostomy despite adenotonsillectomy.

**Conclusions:** Adenotonsillectomy can be performed safely in children with CP and OSA. However, close post-operative monitoring is critical. Many children will obtain a reduction in AHI but additional surgical management is often required. Additional research is needed to specifically determine how to best manage OSA in children with CP.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Perceived Barriers to Research in Pediatric Otolaryngology: Survey of American Society of Pediatric Otolaryngology (ASPO) Members

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### Abstract

**Introduction:** Barriers in the research process may discourage participation by clinicians. The goal of this study is to present the perceived barriers to research that American Society of Pediatric Otolaryngology (ASPO) members are facing, in response to a request from Sentac research committee.

**Methods:** A questionnaire related to research barriers was administered to ASPO members (August-December 2019) following approval. Responses were analyzed using odds-ratios, multiple-regression analysis and descriptive statistics, focusing on gender disparity and factors that increase likelihood of spending more time on research and funding success.

**Results:** There were 131 participants: 69% male, 27% female, 3% preferred not to say. Fifty-six-percent felt that research is important, at least a 4 on a 5 point scale. Twenty-five-percent spend more than 10% of time on research; 54% wish they had more time to pursue research. The greatest perceived barriers were protected time (88%), funding (53%) and knowledge of statistics (27%), not significantly different between genders. Those who spent more than 10% of time on research were more likely to be female, had funding, and at an institution that provided protected time for research. Those who reported having funding were more likely to practice in academics, and have resources to help with the research process. Results held true when adjusted for possible confounding variables.

**Conclusion:** This study suggests that the majority of ASPO respondents felt that research is important and want to spend more time on research. The results of this survey provide insight into the perceived barriers to perform research successfully.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Does adenotonsillectomy improve obstructive sleep apnea in children with cerebral palsy?

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### Abstract

**Background:** Children with cerebral palsy have an increased prevalence of obstructive sleep apnea. This may be due to hypotonia, adenotonsillar hypertrophy, facial skeletal hypoplasia, or a combination of multiple factors. In this complex patient group, the decision for how to manage obstructive sleep apnea (OSA) can be difficult.

**Methods:** This was a retrospective chart review of 157 patients with a diagnosis of cerebral palsy who underwent polysomnogram between January 1, 2000 and December 31, 2019. Clinical data was gathered including tonsil and adenoid size, polysomnogram records, and surgery performed.

**Results:** In children who underwent adenotonsillectomy with preoperative and postoperative polysomnograms available, every patient had preoperative severe OSA, and there was a significant decrease in the obstructive apnea hypopnea index (oAHI) with mean decrease of 51.2% (preoperative mean 25.5  $\pm$  4.7 events/hr, postoperative mean 13.6  $\pm$  6.1 events/hr,  $p=0.02$ ). Surgical cure was achieved in 29% (OAH  $<2$  events/hr), 71.4% had a postoperative oAHI  $>5$ , and 29% had residual severe OSA (oAHI  $>10$ ). One patient had an increase in their oAHI of 12.5 events/hr (oAHI 19.2 to 31.7). Compared to children who underwent other upper airway procedures, children who received a tonsillectomy and/or adenoidectomy had larger tonsils and adenoids.

**Conclusion:** Managing OSA in children with cerebral palsy is difficult. Adenotonsillectomy provides some benefit with a mean decrease of 51% with 29% achieving cure. However, 71% of patients had residual moderate or severe OSA that would need PAP therapy. Understanding this response can be helpful for counseling families and clinical decision making.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

The Effect of Local Anesthetic Injections on Subjective Pain Scales in Pediatric Tonsillectomies: A Meta-Analysis

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### Abstract

**Objective:** To assess the effect of local anesthetic injection on subjective pain scores for pediatric tonsillectomies on post-operative day (POD) 0 and 1.

**Methods:** A 2-researcher team following the PRISMA guidelines performed a systematic review and meta-analysis. A comprehensive literature search was conducted utilizing Pubmed.gov, Embase, Web of Science, and Scopus databases. Studies written with original data utilizing a saline injection control arm were selected. Corresponding authors were contacted for missing data, which was used when possible. The collated data was analyzed with Review Manager (RevMan) Version 5.4., The Cochrane Collaboration, 2020. Surgical technique subgroup analysis was performed.

**Results:** 319 publications were identified and 10 articles with 16 total experimental arms (627 participants) were selected for metaanalysis. Local anesthetic injection was compared to placebo with saline injection. The standard mean difference for POD 0 was -0.81 [-1.16, -0.46] ( $P < 0.00001$ ) in favor of local anesthetic. The standard mean difference for POD 1 was -0.67 [-1.35, 0.01] ( $P = 0.05$ ), in favor of local anesthetic. Subgroup analysis by surgical technique showed a less robust effect for cautery excision versus cold excisional technique, with or without cautery-based hemostasis.

**Conclusions:** A local anesthetic injection during a pediatric tonsillectomy reduces postoperative pain on POD 0 and 1. Further analysis on total narcotic use and postoperative complications would benefit surgeon decision making.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Development of Consensus Guidelines for Performing and Interpreting Fiberoptic Endoscopic Evaluation of Swallowing

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### Abstract

#### Background

The use of FEES (Fiberoptic Endoscopic Evaluation of Swallowing) was first described in 1988 by Langmore and colleagues and is recognized as a procedure within the scope of the speech-language pathologist. Knowledge and skill guidelines to ensure competency of the speech pathologist were first published by the American Speech Language and Hearing Association (ASHA) in 2004. As the use of FEES has steadily increased across conditions and settings in adult and pediatric populations, the development of updated consensus guidelines is necessary.

#### Methods

Appointed representatives of the America Board of Swallowing and Swallowing Disorders Specialists (AB-SSD) and Special Interest Group (SIG) 13 have formed a taskforce to develop an updated consensus guidelines document for best practice. Review of current training and practice trends has informed the development of updated consensus guidelines.

#### Results

The taskforce has developed proposed consensus guidelines which include indications and contraindications for a FEES procedure, necessary equipment, patient preparation, examination protocols, and scoring/interpretation for patients across the lifespan. A section on best practice for FEES training is included.

#### Conclusion

This session is designed to provide updated information regarding the development of consensus guidelines for performing and interpreting Fiberoptic Endoscopic Evaluation of Swallowing (FEES) across the lifespan, with emphasis on the pediatric population.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Acid Suppression Does Not Improve Laryngomalacia Outcomes but Treatment for Oropharyngeal Dysphagia Might Be Protective

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### Abstract

**Background:** Infants with laryngomalacia are frequently treated with acid suppression due to concerns about reflux contributing to disease severity while oropharyngeal dysphagia is now more widely recognized in laryngomalacia, but the impact of either approach is unknown. Our aim was to determine if acid suppression and oropharyngeal dysphagia treatment impact laryngomalacia outcomes.

**Methods:** We reviewed records of infants at Boston Children's Hospital in 2017 for laryngomalacia severity on nasopharyngoscopy, acid suppression use, videofluoroscopic swallow study (VFSS) results, hospitalization risk, and supraglottoplasty requirement. Proportions were compared with binary logistic regression and survival analysis completed with Cox regression to adjust for covariates.

**Results:** Of 236 subjects, 78% had mild and 22% moderate-to-severe laryngomalacia. 55% were treated with acid suppression, with no difference by severity ( $p=0.435$ ). 17% required supraglottoplasty. Patients with laryngomalacia who were prescribed acid suppression were more likely to have respiratory hospitalizations (OR 2.528, 95%CI 1.320-4.841,  $p=0.005$ ) and more likely to require supraglottoplasty (OR 3.421, 95%CI 1.320-9.392,  $p=0.012$ ), even after adjusting for disease severity/comorbidities. Time from presentation to supraglottoplasty was shorter on acid suppression, even after adjustment (5.64+/-0.92 vs 7.98+/-1.92 months,  $p=0.006$ ). 36% underwent VFSS and 69% had aspiration/laryngeal penetration. Subjects receiving thickening for oropharyngeal dysphagia had fewer respiratory hospitalization nights (0.54+/-0.19 vs 2.51+/-0.76,  $p=0.013$ ) and longer time to supraglottoplasty (9.3+/-1.7 vs 4.56+/-0.73 months,  $p=0.002$ ), even after adjustment.

**Conclusion:** Acid suppression is associated with increased odds of supraglottoplasty, even after adjustment for disease severity. Oropharyngeal dysphagia is common in infants with laryngomalacia and treatment with thickening might be protective.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Provider Experience of a Virtual Aerodigestive Clinic

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### Abstract

**Background:** The COVID pandemic has altered the landscape of clinical medicine. Virtual clinics reduce exposure risk, important for medically complex patients. This study aims to characterize provider experience of a virtual compared to in-person aerodigestive clinic (ADC).

**Methods:** A virtual ADC was developed at our pediatric academic center consisting of HIPAA-compliant video visits, including breakout patient and provider rooms. Patients were triaged for candidacy for video vs. in-person visits. A mock clinic tested the virtual platform in advance and a 5-point Likert scale survey was administered post-clinic to evaluate the virtual format.

**Results:** 22 patients attended virtual ADC clinic over a four-month period. No show rate was similar to in-person clinics (9% vs.11%). 1 patient required an additional in-person assessment for airway exam and PMV trial. Survey respondents included administrators, gastroenterologists, pulmonologists, otolaryngologists and speech language pathologists (n=9). 78% found mock clinic useful. All providers viewed virtual ADC as comparable or better in time and clinical efficacy to in-person clinic. 78% reported extreme satisfaction and 22% reported moderate satisfaction overall. Advantages included assessment of home environment and equipment (44%), less financial and logistical patient burden (11%), and social distancing for patients (11%). Disadvantages included time expenditure on clinical coordination (22%) and physical exam limitations (44%). Technical challenges included difficulty with internet connection (22%) and obtaining interpreters (22%).

**Conclusion:** Virtual ADC clinics are time efficient and clinically effective with high satisfaction among providers at our institution. Further areas of study include patient satisfaction, clinical outcomes and cost analysis between clinical models.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Tracheal decellularization preserves the micromechanical stiffness of cartilage extracellular matrix

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### Abstract

**Objective:** Long-segment tracheal defects are potentially life threatening for pediatric patients. Decellularized trachea grafts (DTG) are a promising solution for tracheal replacement, possessing biomimetic cues that promote regeneration. However, DTG collapse has been a major limitation for translation. This study aims to characterize the mechanics of the microenvironment in DTG to develop a tissue engineered trachea graft (TETG) that preserves graft patency. We hypothesized that DTG would have reduced stiffness compared to native trachea.

**Methods:** Decellularized and native grafts from C57BL/6J mice prior to implantation and after 28 days of orthotopic implantation were formalin-fixed and paraffin-embedded (N = 3 / native, 3 / DTG). Samples were sectioned and histologically stained by Alcian blue for glycosaminoglycans (GAGs) and Mason's Trichrome for collagens. Atomic force microscopy (AFM) was used to analyze the Young's modulus in different regions of the cartilage, including chondrocytes, perichondrium, and cartilage extracellular matrix (ECM).

**Results:** The histological and AFM results showed that GAGs, collagens and the stiffness of cartilage ECM in DTG was preserved in decellularization. Prior to implantation, the stiffness in the perichondrium and chondrocytes were significantly reduced with decellularization ( $p < 0.0001$ ). After 28-days implantation, chondrocytes in DTG showed no difference compared to STG, but the perichondrium had a lower stiffness in DTG than in the STG.

**Conclusion:** These results demonstrated a restoration of chondrocyte stiffness and a maintained stiffness of cartilage ECM in DTG. This will further the development of tracheal grafts to treat pediatric long-segment tracheal defects.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Ansa cervicalis to recurrent laryngeal nerve anastomosis for unilateral vocal cord paralysis in children: a systematic review

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### Abstract

Reinnervation of a paralytic vocal cord via an ansa cervicalis to recurrent laryngeal nerve (ANSA-RLN) anastomosis has grown in popularity over the past decade. This systematic review examines the current literature and investigates outcomes in the pediatric population.

A systematic literature search of PubMed/MEDLINE, Scopus, Cochrane Library, and EmBase was performed utilizing PRISMA guidelines. Studies with pediatric patients undergoing ANSA-RLN for unilateral vocal cord paralysis (UVCP) were identified. Sixteen studies encompassing 133 patients were included, of which 12 were published in 2010 onward. Patent ductus arteriosus ligation was the most common cause of UVCP (52.8%). 40.6% of patients undergoing ANSA-RLN anastomosis underwent a concomitant procedure, most commonly injection laryngoplasty. Six studies reported utilizing laryngeal electromyography (LEMG) prior to surgery, although none reported changes to the surgical plan based on LEMG findings. Dysphonia was the most common indication, followed by dysphagia. Outcomes measures for dysphonia were reported heterogeneously, ranging from caregiver subjective assessment to formal pediatric voice handicap index (pVHI) assessment. Statistically significant improvement in pVHI was reported in the three studies which utilized it. Outcome measurements were also heterogeneous for dysphagia, ranging from caregiver/patient subjective assessment to videofluoroscopic swallowing study (VFSS). In patients evaluated with VFSS, 16/17 demonstrated full resolution. One adverse event was reported, a hypertrophic surgical scar.

ANSA-RLN anastomosis for UVCP in children appears safe and efficacious for treatment of both dysphonia and dysphagia. Future studies should focus on reporting with pVHI and objective swallow study data for standardization and validation of outcomes.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Abstract Session 2

December 4<sup>th</sup> 10:45am CST

#### Title of Paper

Hearing outcomes in infants identified with Cytomegalovirus at birth who receive oral Valganciclovir

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#### Abstract

**Objective/Hypothesis:** Sensorineural hearing loss (SNHL) is a common sequelae of congenital cytomegalovirus (cCMV) and often follows a progressive course. The objectives of this study were to: 1) assess the characteristics of infants presenting with cCMV-related SNHL who are eligible for treatment with Valganciclovir 2) observe the natural history of SNHL during Valganciclovir therapy and beyond 3) consider their hearing rehabilitative needs.

**Methods:** In this retrospective study of a prospectively acquired cohort, 120 children were diagnosed with cCMV-related SNHL at a single tertiary referral hospital over a 20-year time period. Sixteen of these (6 male, 10 female) were eligible and received Valganciclovir. Outcome measures were results of newborn hearing screening (NHS), diagnostic audiologic assessments, and hearing rehabilitation.

**Results:** All children referred on their NHS with the majority referring bilaterally while a third (31.2% (5/16)) referred unilaterally. None of the children with unilateral SNHL went on to develop bilateral impairment. For ears with SNHL, the mean (SD) of all available frequencies was 82.1 dB (17.6) on the left and 64.2dB (23.5) on the right. Ten ears received cochlear implantation (CI) (2 bilaterally, 6 unilateral).

#### Conclusions/Summary:

None of the children treated with Valganciclovir with unilateral SNHL went on to develop bilateral SNHL during the brief follow up for this study. In children with cCMV who present with congenital SNHL, their degree of loss was on average severe at the outset, with many having SNHL within the range suitable for CI, leaving little room for progression or potential measured benefit from Valganciclovir.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Hearing evaluation in extreme premature born patients after passing newborn hearing screening. What have we learned?

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### Abstract

**Introduction:** Nowadays there is no universally accepted method of monitoring hearing in extreme premature born patients after they pass their newborn hearing screening test (NHST) in order to detect on time late onset hearing loss.

**Objectives:** To describe the results of the hearing monitoring program of extreme premature born patients after they passed NHST in Luis Calvo Mackenna Hospital, Santiago, Chile.

**Methods:** Transversal study. Extreme premature newborns born in 2016 and 2017 in the East Metropolitan Area of Santiago, Chile were planned to be seen once a year by our audiology and otorhinolaryngology team. We present our data analyzed in September 2020.

**Results:** During 2016 and 2017 80 extreme premature babies were born. NHST had a coverage of 95%, with 5% refer. After completing diagnostic hearing evaluation only one patient had hearing loss. 79 patients were included in our study, we did 58 evaluations in 53 patients, achieving a 67% of at least one audiological evaluation after NHST. The most frequent audiological test used was automated auditory brainstem response. We detected 3 patients with late onset hearing loss in our study, one of them with moderate neurosensorial hearing loss due to congenital citomegalovirus infection that was diagnosed at 1 year of age.

**Conclusions:** To improve our program, we need to communicate better the importance of late onset hearing loss to caregivers (parents and health professionals) of our study population and optimize their hospital visit by offering in one day, the audiological and medical evaluation of our patients.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Reliability of CT Measurements to Determine the Length of the Pediatric Cartilaginous Eustachian Tube: Implications for Balloon Dilation

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### Abstract

**Background:** Endoscopically balloon dilation procedure with 2 cm catheter placement into the eustachian tube (ET) orifice to treat obstructive ET dysfunction showed improvements in adults. A significant knowledge gap is whether 2 cm is safe distance for a child. This study is to create a simple and reproducible approach to measure the length of the cartilaginous portion of the ET and determine whether it varies by age or gender.

**METHODS:** Pediatric neck CT scans were reformatted to project the cranial and caudal limits of the cartilaginous ET. The length was measured bilaterally in 95 children who underwent these procedures not related to ET function. These measures were obtained independently by 4 physicians, compared for inter-observer reliability and correlated to age or gender.

**RESULTS:** The cartilaginous ET length was  $25.24 \pm 2.86$  mm for the right,  $25.18 \pm 2.78$ mm for the left ear and  $25.21 \pm 3.10$  mm for all measurements. The range was between 18.12mm and 32.28mm. There was no statistically significant difference between the right and left side ( $P=0.602$ ). Inter-rater reliability was excellent with an intraclass correlation coefficient of 0.936. The ET length of children increased over age ( $P<0.001$ ). The ET length less than 20mm was observed in some children under 4 years old ( $N=4$ ). Females had shorter cartilaginous ET lengths ( $P=0.004$ ).

**CONCLUSION:** The cartilaginous portion of the pediatric ET can be measured with good precision using reformatted CT images. Females and younger children have shorter cartilaginous ET length. These results have relevance in determining safe catheter insertion depth for pediatric ET dilation procedures.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Do ocular vestibular-evoked myogenic potentials yield abnormal testing results among pediatric patients with vestibular migraine?

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### Abstract

**Introduction:** While ocular vestibular evoked myogenic potentials(oVEMP) has been associated with vestibular migraine(VM) in adults, no prior studies have evaluated this metric among pediatric patients with VM. Recent data suggests that oVEMP asymmetry with normal cervical VEMP(cVEMP) findings may represent a reliable VM biomarker in adults. We sought to characterize VEMP results among pediatric patients with VM and benign recurrent vertigo of childhood(BRVC), a migraine precursor.

**Methods:** This was a retrospective chart review of a multidisciplinary pediatric vestibular clinic. A total of 474 pediatric patients were evaluated over a 3-year period. Medical records were reviewed, inclusive of history, physical therapy, audiometry, and vestibular testing results. VEMP testing was performed with a 500Hz tone burst. Based on adult normative data, oVEMP asymmetry was defined as >33% interaural difference; cVEMP asymmetry was defined as >41%.

**Results:** Thirty-three patients(7%) were diagnosed with VM, with a mean age of 13 years(6-17 years;SD 3.4y). Seven patients(1.5%) had BRVC, with a mean age of 6 years (3-9;SD 2.3y). Among 35 subjects who underwent oVEMP testing, 6 had oVEMP asymmetries with a mean of 43.9%(33-61%;SD 10.2%), a rate of 17.1%. Zero subjects demonstrated asymmetry in cVEMP testing.

**Conclusions:** VM and BRVC remain rare but notable causes of vertigo among pediatric patients. oVEMP asymmetry was identified at a rate of 17% based on adult normative data. Similar to the adult VM population, oVEMP asymmetry with normal cVEMP may be a useful biomarker in the right clinical setting for pediatric VM.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Dizziness in the Post-Concussive Pediatric Patient: A Review of a Multidisciplinary Pediatric Vestibular Clinic

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### Abstract

**Introduction:** Dizziness and imbalance has been estimated to occur in ~5% of pediatric patients in a national health survey, with close to half seeking evaluation from a health professional, and about one-quarter of pediatric patients with persistent dizziness following a concussive event were found to have undiagnosed peripheral vestibular disorder. We sought to evaluate the final diagnosis among patients with a history of concussion with persistent symptoms who were evaluated in our multidisciplinary pediatric vestibular clinic.

**Methods:** This was a retrospective chart review of a multidisciplinary pediatric vestibular clinic at a tertiary care center. A total of 474 pediatric patients with balance-related complaints were evaluated over a 3-year period. Medical records were reviewed, inclusive of relevant history, physical therapy evaluation, and audiological evaluation inclusive of both audiometric and vestibular testing results. All patients with a history of concussion were included in this review.

**Results:** Sixty-four patients with a history of concussion were identified, with mean age of 14 years(4-19;SD 3y). Most patients(75%) were female and Caucasian(78%). Fifteen subjects (23%) were diagnosed with post-concussive phenomenon. The most common diagnosis was vestibular migraine, seen in 18 patients (28%), followed by autonomic/vasovagal disturbance, seen in 6 patients (9%). No diagnosis was identified in 9% of patients.

**Conclusions:** In this multidisciplinary pediatric vestibular clinic, post-concussion dizziness was relatable to non-concussive disorder in up to two-thirds of patients, a rate higher than previously reported in the literature. While dizziness after concussion is a common experience, persistent dizziness may represent an undiagnosed underlying balance disorder.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Parent-child agreement on quality of life in children with hearing loss using the HEAR-QL

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### Abstract

**Background:** Quality of life (QOL) for children with hearing loss (HL) can either be child- or parent-proxy reported. We explored whether children with HL and their parents perceive the child's QOL similarly.

**Methods:** We conducted a cross-sectional study of 7-14 year old children with unilateral or bilateral HL and their parents, to evaluate the correlation of child and parent paired responses on the HEAR-QL (Hearing Environment And Reflections on Quality of Life), a validated hearing-related QOL survey. The HEAR-QL has 3 domains and Total score, ranging from 0-100; higher scores indicate higher QOL.

**Results:** HEAR-QL Total score ( $r = 0.520$ ,  $p = .011$ ), Activities ( $r = 0.608$ ,  $p = .002$ ), and Feelings ( $r = .657$ ,  $p = .001$ ) domains correlated strongly, but the hearing Environments domain ( $r = .291$ ,  $p = .178$ ) correlated weakly. Children with mild HL scored Total and Environments domains lower than their parents (mean difference [MD] -13.9 (95% CI -34.3, 6.6) and -19.2 (95% CI -41.2, 2.7); Cohen's  $d$  0.72, 0.88, respectively) compared to children with moderate-to-severe HL (moderate HL MD 8.3 (95% CI -15.7, 32.4) and 13.1 (95% CI -25.2, 51.5); severe HL MD 9.5 (95% CI 0.6, 18.4) and 14.4 (95% CI 4.3, 24.6)).

**Conclusion:** Children and their parents had strongly correlated HEAR-QL scores for observable Feelings and Activities domains but weakly correlated hearing difficulty in Environments scores. Parents of children with mild HL perceived their children's QOL to be better than the children themselves, differing from the moderate-to-severe HL groups.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Comparisons of Eustachian tube Passive Resistance and Compliance in people with and without chronic middle ear disease

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### Abstract

**Objective:** Compare two measures of the Eustachian tube (ET) passive properties, the resistance to the passage of airflow (Passive Resistance - PR) and the distensibility at different airflows (Compliance - C), between groups of people with and without history of chronic middle ear (ME) disease.

**Methods:** Group 1 (control) consisted of 11 adults with no history of ME disease and with normal otoscopy and tympanogram who had a ventilation tube inserted in their eardrum for research purposes. Group 2 (disease group) consisted of 27 adults and 23 children with unilateral (n=50) or bilateral (n=15) ventilation tubes inserted for chronic or recurrent ME infections or fluids. Analysis of Variance was used for measures of PR ( $PR=P/Q$ ) and C ( $C=PR_{15}/PR_{30}$ ) derived from tests done at airflows of 15 ml/min and 30 ml/min.

**Results:** There were 29 females, 53 whites and 65 ears included in the analysis. The mean age in Groups 1 and 2 were 29 (20-41yo) and 21(7-43yo) respectively. The ETF measurements of mean  $\pm$  STDEV were  $PR_{15}=8.5 \pm 4.1$ ,  $PR_{30}=6.7 \pm 3.1$  and  $C=1.3 \pm 0.11$  in Group 1 and  $PR_{15}=11.4 \pm 9$ ,  $PR_{30}=9.2 \pm 8.2$  and  $C=1.3 \pm 0.2$  in Group 2. When stratified by age, children's ET passive properties were similar to those of the adult controls, but adults with chronic ME disease showed higher  $PR_{30}$  ( $p=0.04$ ) and lower C ( $p=0.04$ ).

**Conclusion:** The ETF test results of adults with chronic ME disease showed characteristics compatible with a stiffer ET.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

A Retrospective Analysis of Superficial Cervical Plexus Blockade for Children Undergoing Otologic Surgery

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### Abstract

**Background:** Usage of ultrasound-guided superficial cervical plexus block (SCPB) has been well-documented in adults for anterior and lateral neck surgeries; their role in the pediatric population is less clear. This study compares postoperative outcomes in pediatric patients who received a SCPB to patients who did not.

**Methods:** This was a single-center retrospective cohort study of patients aged 1-18 years undergoing cochlear implantation, tympanomastoidectomy, tympanoplasty, or myringoplasty via a postauricular incision over a 3-year period. Patients undergoing bilateral surgery, concurrent surgery (exclusive of myringotomy or endoscopic otologic procedures), or transcanal otologic procedures were excluded. Primary outcomes were intraoperative and postoperative IV morphine equivalents and the composite outcome of antiemetic use, nausea, or vomiting. Secondary outcomes were length of stay in the postoperative anesthesia care unit and hospital, time to first oral intake, and adverse events. Descriptive statistics characterized patient demographics, surgery type, and SCPB details. Analyses were stratified by age and surgery type.

**Results:** Two hundred and thirty-seven patients met inclusion criteria; 121 patients (51%) received a SCPB. When stratified by surgery type, there was a trend toward lower intraoperative IV morphine equivalents and composite nausea-related events for patients receiving a SCPB. There was no difference in postoperative IV morphine equivalents, number of antiemetics given, or secondary outcomes between SCPB and non-SCPB groups.

**Conclusion:** Very few postoperative nausea-related events occurred, which did not allow demonstration of difference between groups. Opioid usage outcomes were driven by a few outliers. Attempts to decrease opioid usage may require alternative adjuvants to regional nerve blocks.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Taking the Aerodigestive Clinic Virtual: Survey Results of Patient Experience

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### Abstract

#### Background:

Due to the COVID-19 pandemic, many multidisciplinary aerodigestive programs incorporated telehealth to evaluate children with complex aerodigestive conditions. The efficacy of telehealth for aerodigestive patients has not been reported. The study objective was to assess parent/caretaker satisfaction with Aerodigestive telehealth visits at our institution instituted in March 2020 in response to covid 19

#### Methods:

Our team constructed a psychometric instrument to evaluate the family perspective of a virtual aerodigestive clinic. This survey was created using RedCap software, and was approved by our institutional review board. Survey questions were developed from validated telehealth satisfaction surveys, and a validated aerodigestive clinic satisfaction survey. Questions focused on patient/family telehealth experience, satisfaction, ease of use, picture/sound clarity, patient-physician interaction, and comfort of scheduling operations without a personal visit.

#### Results:

40% of polled families (n=26) participated and completed the survey. There were seven clinic dates from March to August of 2020. 90% of participants agree/strongly agree that telehealth: 1)improved access to aerodigestive care 2)allowed for more immediate care 3)was enjoyable to use 4)was easy to learn 5)allowed for effective expression and communication 6) was a comfortable alternative to live clinic 7)provided a satisfactory visit, and 8)would be suitable to use in the future. 60% of families agree/strongly agree they were comfortable with scheduling endoscopy under general anesthesia after a telehealth visit without need for a clinic visit. 50% of caretakers "felt something was missing" during the virtual visit that would have been present at a live visit.

#### Conclusion:

Telehealth is an effective tool for aerodigestive clinics in some patients, particularly when circumstances prevent clinic visits.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

From telemedicine pilot to practice change? Aerodigestive clinic during the pandemic and beyond

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### Abstract

**Introduction:** The impact of COVID-19 in healthcare has necessitated the design of alternative care delivery models. Aerodigestive patients present with multiple complex issues and require the expertise of a multidisciplinary evaluation for effective care, not thought possible via the telemedicine route. We discuss our novel telemedicine experience and its impacts on patients.

**Methods:** Survey of providers and patients who completed virtual visits utilizing the “virtual room” . This feature allowed delivery of care from multiple providers simultaneously.

**Results:** All providers and patients were satisfied with “virtual room” sessions. They found the technology easy to use and visits timely. Parents noted improved satisfaction, primarily due to not having to repeat their history several times. Some patients required an in-person visit, which led to the development of a hybrid clinic, with some providers attending via telemedicine and others in-person. This was found most optimal for providers and families, and even facilitating an increase in patient volumes.

**Conclusion:** The role of telemedicine is ever expanding. Creation of a “virtual room” allowed all providers to be present simultaneously, improved provider and patient satisfaction, and even led to the development of a hybrid clinic. The dual modality approach to care delivery provided an unrealized benefit and the family unit finding it efficient and comparable. Telemedicine in this setting had not been thought feasible, yet our experience has revealed that not only is this possible, but perhaps equally viable, or even preferable, alternative in the future.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Risk Factors for Vocal Cord Paralysis Following Repair of Congenital Cardiac Anomalies

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### Abstract

#### Background

Recurrent laryngeal nerve injury resulting in vocal cord paralysis (VCP) is a complication of cardiothoracic surgery. VCP is associated with dyspnea, dysphagia and dysphonia. Reported incidence ranges from 1-32%. Cardiac anatomy matters, as repair of certain congenital cardiac lesions places the recurrent laryngeal nerves at greater risk. This study uses a large cohort to identify risk factor for VCP following cardiothoracic surgery.

#### Methods

Children who underwent open cardiothoracic surgery at a tertiary care medical center between 2009-2011 were included in an IRB approved database. Demographics, comorbidities, operative, and longitudinal follow-up data were captured. Statistical significance was set a priori at  $p < 0.05$ .

#### Results

Out of 525 patients who met inclusion criteria, 41 (8%) were diagnosed with postoperative VCP by flexible laryngoscopy. Demographics were comparable across those diagnosed with VCP versus those who were not. There were no differences in VCP rates among those with a genetic syndromes ( $p = .466$ ) or who underwent preoperative intubation ( $p = .155$ ). Patients with single ventricle physiology had significantly higher rates of postoperative VCP (17% vs 1%,  $p = .014$ ). There were higher VCP rates among patients with hypoplastic left heart syndrome (HLHS) versus those with two ventricle surgery (37% vs 21%,  $p = .007$ ). Those with postoperative VCP had significantly higher rates of airway malacia (50% vs 14%,  $p < .001$ ).

#### Conclusion

Patients with congenital cardiac anomalies that include HLHS have increased risk for VCP due to required aortic arch reconstruction. Future studies will determine the effects of early-intervention in VCP on feeding and voicing outcomes in children born with single ventricle physiology.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Feeding and Swallowing Outcomes in Infants Born via EXIT Procedure for Head and Neck Masses

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### Abstract

#### Background

Large fetal head and neck masses are often life-threatening at birth requiring intubation or tracheostomy with additional otolaryngologic management as indicated. Though some data exists on medical/surgical intervention, there is a paucity of literature published on feeding-swallowing in this population. The purpose of this study is to highlight the feeding-swallowing trends and to underscore the importance of early intervention by speech pathology for optimal outcomes.

#### Methods

A retrospective review of 6 infants born via EXIT to airway due to large airway masses who were followed by speech pathology was completed. Data from clinical swallow evaluation and videofluoroscopic swallow studies were analyzed and findings were cataloged.

#### Results

Majority of patients demonstrated feeding deficits based on findings from first clinical swallow evaluation with deficits in latch (100%), suck coordination (66%), and suck-swallow ratio (83%). Two patients demonstrated tracheal aspiration on initial VFSS. Repeat VFSS noted resolution in one patient and persistent aspiration in the other. All patients were discharged from NICU with supplemental feeding system. Use of supplemental feeds was eliminated in 83% of the patients with average discontinuation at 16.8 months.

#### Conclusion

The results of this study emphasize the importance of timely and comprehensive feeding-swallowing assessment and intervention for infants with airway masses. The vast majority of the infants in this study demonstrated some degree of oral-pharyngeal dysphagia but with consistent and targeted intervention were able to initiate oral intake, eliminate feeding tube use over time, and ultimately consume an age-appropriate diet relative to peers.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Shared Laryngoscopes in Combined Endoscopy Procedures: A Quality Improvement Initiative

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### Abstract

The Aerodigestive program at Children's Hospital Colorado (CHCO) performs between 150 and 200 combined endoscopies a year. These procedures consist of flexible bronchoscopy, rigid microlaryngoscopy and bronchoscopy, and upper intestinal endoscopy, all under a single episode of general anesthetic. While previous work has demonstrated how these combined procedures reduce cost to health care organizations and payers, there remain numerous opportunities for cost and waste reduction, including sharing of disposable laryngoscopes. These plastic, single use devices are opened for each case by both the anesthesia and otolaryngology services. It is common for one set to go unused or used only to apply topical lidocaine to the larynx. At a cost of approximately \$18 to the organization for a handle and blade, as well as material that must be ordered, shipped, stored, and then properly disposed of, this extra equipment represents \$2,700-3,600 in likely unneeded expense and waste annually in our combined procedures. Through implementation of a Plan Do Study Act (PDSA) quality improvement project, the CHCO Aerodigestive Program implemented team member education regarding sharing of this vital equipment prior to case starts, tracked adherence to sharing as well as barriers to sharing, refined team member education after data analysis, and implemented one laryngoscope use for combined endoscopy. In 2019, otolaryngology performed 631 diagnostic endoscopies (including those in the Aerodigestive program), not counting those with interventions (eg supraglottoplasty). Implemented at the organization, cost savings at our institution are estimated at  $\geq$  \$11,000 annually.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Incidence of Vocal Fold Hypomobility Following Esophageal Atresia Repair - A Systematic Review

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### Abstract

**Introduction:** Improved survival in esophageal atresia (EA) and tracheoesophageal fistula (TEF) patients has shed increasing light on morbidities and complications from EA/TEF repair. Vocal fold hypomobility is a well-established complication from both open and thoracoscopic repair; however, significant variability of incidence estimates exists across studies.

**Methods:** A 40-year systematic review of PubMed and Embase databases was performed identifying studies and case series with 10 patients or more published from 1980 to 2020. Data was extracted and analyzed using descriptive statistics.

**Results:** 21 articles were identified with a total of 1,855 patients. Across all studies vocal fold motion was assessed using flexible laryngoscopy postoperatively. 7 articles assessed this in all patients postoperatively, 14 only in patients deemed symptomatic (stridor, dysphagia, dysphonia). Rates of vocal fold hypomobility ranged from 2.2% to 50% (weighted mean and standard deviation  $8.7 \pm 17.5\%$ ). In studies detailing laterality, 55.8% were left sided and 44.2% were right sided. Across studies reporting this outcome,  $15.2 \pm 33.9\%$  of patients with vocal fold hypomobility underwent tracheostomy (range 0% to 66%).

**Conclusion:** Vocal fold hypomobility is common, and its incidence likely underestimated given the lack of routine postoperative screening. Future studies should prospectively study the incidence using routine pre- and postoperative assessment. Furthermore, routine postoperative assessment is worthwhile to help identify potential candidates for early intervention.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Comparison of the use of traditional culture analyze and FilmArray Pneumonia Panel on Bronchoalveolar Lavage of pediatric patients on a Pediatric Aerodigestive Unit in a developing country.

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### Abstract

**Background:** Developing and improving the Pediatric Aerodigestive Unit in Guatemala has been a constant challenge, since Guatemala is a developing country dealing with basic healthcare issues. Even though, we have managed to treat over 150 patients since 2018, according to our data protracted bacterial bronchitis (PBB) is the main diagnosis in children under 5 years old with chronic cough. On the first year and a half our pathogen diagnosis was limited to bronchoalveolar lavage (BAL) cultures, depending on their low sensitivity, mostly when children received antibiotic treatment days before the bronchoscopy; and also depending on the required time to have a result. By the end of 2019 "The Biofire FilmArray Pneumonia Panel" was available, having results in a shorter period and more detailed pathogen sensitivity and specificity.

**Objective:** The goal of this study is to demonstrate that pathogen identification is more frequently done and in shorter time through the implementation of molecular technology to analyze BAL samples, comparing to BAL cultures alone.

**Methods:** A total of 119 BAL samples were obtained from January 1st 2019 to August 31st 2020, 89 samples were traditionally analyzed with culture and 30 samples were analyzed with Culture and FilmArray. The positive and negative pathogen results were compared for both groups of samples.

**Results:** In the first group, the proportion of detected pathogens was 0.24 and 0.83 in the second group. The positive agreement proportion in the second group was 0.68, the negative agreement was 0.08 and the disagreement was 0.24.

**Conclusion:** Having implemented reliable, fast, accurate diagnostic tools helped us perform a better microbiological-clinical analysis to rationally use antibiotics according to the main pathogen, reduced hospital stay and costs for patients.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Pediatric Cochlear Otosclerosis with Halo Sign

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### Abstract

#### Background

Otosclerosis is a rare disorder that typically causes conductive hearing loss in adults in their third decade of life, and a pediatric presentation is even more uncommon.

#### Methods

A review of the operative notes, pathology reports, records, and imaging was performed along with a review of the literature. Case A 12-year-old male presented to our clinic with 1.5 years of decreased hearing and left-sided intermittent tinnitus. His father had recently undergone stapedectomy. Audiogram was notable for moderate left conductive hearing loss and Carhart notch at 2000 Hz, while a baseline audiogram from 6 years prior showed normal hearing thresholds bilaterally. Noncontrasted CT of the temporal bones revealed a halo sign of the cochlea bilaterally with density of the fissula ante fenestram greater on the left than on the right. The patient reported no functional hearing deficits in his daily activities and declined both hearing amplification and surgical intervention.

#### Conclusion

Otosclerosis typically causes a conductive hearing loss that is thought to have an age of onset at or after puberty up to age of 30. However, the hearing loss does not become clinically significant until later causing typical patient presentation to be in an adult. We present this uncommon case as a reminder of the importance of a broad differential when approaching pediatric hearing loss.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Abstract Session 3 December 4<sup>th</sup> 2:30pm CST

#### Title of Paper

Leveraging the EMR and "MyChart" to Improve Efficiency of Care for Postoperative Tonsillectomy Patients: A Quality Improvement Project

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#### Abstract

**Background:** Tonsillectomy is a common surgery performed in our pediatric otolaryngology academic practice, with ~2,500 cases done annually. Our standard of care for most patients is a postoperative phone call in lieu of a clinic visit. Because this is such a high volume procedure, the result is a large burden of phone calls for nursing staff. Prior to Covid-19, clinic staff were making 20+ calls a day, and often 3 attempts at calls were needed before reaching the family. The goal of our project was to leverage the EMR by using the "MyChart" function in Epic to send a postoperative tonsillectomy questionnaire instead of the phone call to improve efficiency of care for these patients.

**Methods:** A Pediatric ENT Nurse Practitioner (NP) worked with the information technology team to develop a MyChart questionnaire using the standard questions asked on the phone call. A pilot program was developed where patients were offered the MyChart followup option instead of a phone call. Surgery schedulers were trained on how the process works. The NP was alerted to any tonsillectomies scheduled and set the MyChart questionnaire up to be sent to families 4 weeks after surgery.

**Results:** The NP reviewed all questionnaire answers and followed up by phone only if there were concerns flagged by the responses. This was a time saver for nursing staff and well received by patients and families.

**Conclusion:** The EMR and "MyChart" can be leveraged to improve efficiency of care of postoperative tonsillectomy patients and likely other surgical procedures.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Developmental Outcomes in Infants with Obstructive Sleep Apnea

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### Abstract

#### Background

Growth and developmental consequences of obstructive sleep apnea (OSA) in pediatric patients have been described, however less is understood regarding infants with OSA. We aim to better describe growth and developmental outcomes in infants with OSA.

#### Methods

We conducted a retrospective review of pediatric patients undergoing polysomnography (PSG) from 2012 to 2019. Criteria for inclusion were obstructive AHI score > 1 in the first year of life and clinical follow up documented until 2 years old or resolution of OSA. Demographic, clinical, and PSG data were collected. Descriptive statistics and univariate analyses were used to evaluate associations.

#### Results

91 infants were included in the study. 49 patients had some type of delay, including failure to thrive (FTT) (25), general developmental delay (27), speech delay (23), or motor delay (10). Of patients with any delay, 40.82% were premature, 71.43% had a neurologic comorbidity, and 59.34% had a diagnosed syndrome. 3 patients (6% of patients with any delay) had delay but no associated diagnosed comorbidity. Patients with no delay were significantly less likely to have severe OSA than patients with any delay ( $p = 0.018$ ).

#### Conclusion

OSA in infants is a distinct pathology compared to OSA in children and is associated with developmental outcomes. It remains unclear to what degree OSA is responsible for these findings as opposed to underlying comorbidities. Additional prospective, controlled studies with standardized developmental assessments are warranted to assess causality.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Surgical Management of Pediatric Post-Tonsillectomy Hemorrhage During the COVID-19 Pandemic

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### Abstract

**Background:** During the COVID-19 pandemic, post-tonsillectomy hemorrhage (PTH) management is considered an aerosol generating procedure that warrants precautions for health care providers. The emergent nature of PTH influences the decision to obtain preoperative COVID tests. This study aims to investigate the incidence of COVID symptoms among children presenting with PTH, and to evaluate the safety of preoperative COVID testing.

**Methods:** A retrospective cohort study was conducted at a tertiary care pediatric hospital of all children presenting with PTH that required operative management from April 9th to August 31st, 2020. Data on COVID PCR test collection, test-related adverse events, COVID symptoms, and bleeding severity were reviewed.

**Results:** 18 patients had PTH during the duration of this study. Except for sore throat, which is frequently encountered posttonsillectomy, none presented with COVID symptoms. COVID tests were completed in 15 (83.3%) children without any adverse events and all results were negative. Two (11.1%) with PTH within 24 hours of the tonsillectomy were not tested. One (0.06%) did not have a documented test. Among those tested for COVID, 3 (20%) treatments were deferred for stable patients until COVID results were obtained. Operative control was initiated in 12 (80%) children with pending COVID status due to active bleeding. Average COVID test turnaround time was 269 ( $\pm$  266) minutes.

**Conclusion:** In this series, children presenting with PTH did not show COVID symptoms. COVID tests were administered safely and reported in a timely fashion without swab-related adverse events. Clinical judgement must be utilized to prioritize operative management over testing.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Does perioperative ketorolac increase bleeding risk after intracapsular tonsillectomy?

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### Abstract

#### BACKGROUND

Conflicting evidence exists regarding the post-operative bleed risk associated with perioperative ketorolac use in pediatric tonsillectomy. Surgical technique for tonsillectomy can further confound this risk. Since intracapsular tonsillectomy is associated with lower bleeding rates, the purpose of this study was to retrospectively quantify postoperative bleeding rates after single dose administration of ketorolac in pediatric patients following intracapsular tonsillectomy. A secondary goal of the study was to determine if age, sex, BMI, medical comorbidities and indication for surgery increased postoperative bleeding risk after intracapsular tonsillectomy.

#### METHODS

A total of 1920 children who underwent intracapsular tonsillectomies between January 2017 and December 2018 were eligible for this retrospective cohort study. Age at the time of surgery ranged from 10.7 months to 18.7 years; 931 females and 989 males were included in the study. Patients were divided into two cohorts: 1458 patients (75.9%) received ketorolac (K+) and 462 (24.1%) did not receive ketorolac (NK). Age, sex, BMI, comorbidities, and indication for surgery were also evaluated for association with postoperative hemorrhage.

#### RESULTS

Overall, the postoperative bleed rate was 1.5%. There was no significant difference when comparing bleed rates for the K+ group and the NK group (1.4% vs 1.7%,  $p = .655$ ). Age, chronic tonsillitis, higher BMI Z-scores, ADHD, and behavioral diagnoses were statistically significant risk factors for post-tonsillectomy hemorrhage.

#### CONCLUSIONS

Single dose post-operative ketorolac may be a safe alternative for pain management in pediatric patients undergoing intracapsular tonsillectomy.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Onboarding and Credentialing Advanced Practice Providers in Tertiary Care Pediatric Otolaryngology: A Curriculum in Advanced Pediatric Otolaryngology for Tertiary Hospital and Ambulatory Practice

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### Abstract

#### Background

Inclusion of advanced practice providers (APPs) in hospital-based pediatric otolaryngology has been growing rapidly, aligning with a 70% increase in physician assistants in all surgical subspecialties in recent years. Post-graduate training programs must reflect growing and changing responsibilities.

#### Methods

Curriculum development took place at one institution over 5 years for 11 APPs following a standard Six Step Approach to medical curriculum: 1) Problem Identification and General Needs Assessment, 2) Targeted Needs Assessment, 3) Goals & Objectives, 4) Education Strategies, 5) Implementation, and 6) Evaluation and Feedback. This was integrated into an onboarding process for new hires and a continuing education plan for established providers. Gaps were identified throughout the process to improve education, skills required for competency, and readiness for independent practice.

#### Results

The curriculum incorporated similar goals and objectives to the familiar resident curriculum with significant differences in orientation and onboarding. A Clinical Competency Checklist was used for feedback and to support credentialing after completion of the curriculum. A Procedure Rating Form was used for feedback and documentation of the number of performances required for credentialing. Self-Assessment was utilized to further identify readiness for independence and tailor additional education to meet practice needs.

#### Conclusion

The curriculum and onboarding process presented can be used for any advanced practice provider joining an individual or team of pediatric otolaryngology providers. A standardized curriculum is helpful to the supervisors and trainees. Further collaboration between institutions and development of benchmarks will help ensure excellence in education and ultimately care of pediatric otolaryngology patients.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Pediatric Otolaryngology Telemedicine: Lessons Learned in the Midst of a Pandemic - Looking Towards the New Normal of Virtual Care

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### Abstract

**Introduction:** The COVID-19 pandemic accelerated virtual care, creating the need to study what we learned; Telemedicine is here to stay. We combined a chart review and survey responses from 6 weeks before and after telemedicine. Three study groups included a historical control (those seen in clinic in-person prior to COVID-19), those seen through telemedicine and in clinic during the first six weeks of the national shutdown.

**Methods:** Patients 0-26 years seen in the Pediatric ENT Department from February-April 2020 were emailed surveys asking to rate statements on a scale of 1-Poor to 5-Excellent regarding physician communication, clarity of clinical recommendations, physician/staff courtesy, physician knowledge, and overall outpatient experience. Caregivers assessed their level of agreement with surgical recommendations. Charts were reviewed for demographics, syndromic history, otolaryngology appointment, and surgical/follow-up information.

**Results:** 176 surveys were returned; 113(64.2%) for in-person appointments before telemedicine, 59(33.5%) for telemedicine, and 4(2.3%) for in-person during telemedicine. Those seen in-person before telemedicine had higher satisfaction with physician communication ( $p=.012$ ) and overall experience,  $p=.004$ , but mean responses were still positive. There was 98.6% caregiver agreement with surgical recommendations, but caregivers were 11.5 times more likely to disagree when surgery was not recommended, 86.1%, OR:11.49,95%CI:1.44-91.38, $p=.005$ .

**Conclusion:** Lessons learned to improve virtual care going forward is first, despite longer visits for telemedicine, caregivers were more satisfied with face-to-face physician communication suggesting the need to adopt different communication skill sets virtually. Messaging when surgery is not recommended must be improved to obtain increased caregivers' agreement in an era of "shared decision making."

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Optimal timing and technique for endoscopic management of dysphagia in pediatric aerodigestive patients

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### Abstract

**Background:** The best strategy to manage an interarytenoid defect [Type 1 laryngeal cleft (LC-1) or deep interarytenoid groove (DIG)] in pediatric aerodigestive patients with dysphagia remains uncertain. This study compares the benefit of interarytenoid injection augmentation (IIA) versus suture repair to clinical observation alone in these patients.

**Methods:** A 3-year retrospective, single center analysis identified children with dysphagia undergoing endoscopic airway evaluation. Physician preference guided treatment plan: suture repair with CO2 laser, IIA (carboxy methylcellulose or calcium hydroxyapatite), or observation. Primary outcome was improved post-operative pharyngeal dysphagia on swallow study. Significance was assumed at  $p < 0.05$ .

**Results:** 449 patients underwent diagnostic endoscopy. Mean age at procedure was  $21 \pm 13.26$  months, including 28%  $\leq 12$  months. 79 (18%) had either an LC-1 (n=54) or DIG (n=25). Of this total, 33 (42%) underwent suture repair, 22 (28%) IIA, and 24 (30%) observation only. Dysphagia improved overall in all patients compared to observation (56% vs. 13%,  $p < 0.05$ ). However, children  $> 12$  months were more likely to experience benefit (68% vs. 31%,  $p < 0.05$ ). No infants  $< 6$  months immediately improved. IIA was as effective as suture repair in all patients with LC-1 or DIG (59% vs 55%,  $p = 0.46$ ). In patients with DIG alone, IIA showed significant benefit vs. observation (66.6% vs. 0%,  $p < 0.05$ ).

**Conclusion:** In our pediatric aerodigestive patients with dysphagia, 18% had an addressable lesion. IIA or suture repair similarly improves dysphagia outcomes. Although infants  $< 6$  months of age experience little immediate benefit, over two thirds of patients  $> 12$  months old show dysphagia improvement after intervention.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Normal Swallowing in Healthy Term Infants: Are Signs of Aspiration a Normal Variant?

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### Abstract

**Background:** Feeding therapists regularly evaluate infants for signs of aspiration during feeds. When such events are detected, interventions to mitigate these occurrences are applied. Interestingly, it is widely accepted within the adult literature that occasional instances of aspiration are a normal variant of function that pose no deleterious pulmonary effects in healthy individuals. However, little is known regarding these normal correlates of aspiration in infants. The aim of this investigation is to fill this void by establishing objective normal correlates of feeding performance among healthy, non-dysphagic infants.

**Methods:** Healthy full-term infants without concerns for swallowing impairments were prospectively enrolled for home monitoring of their feeding performance. Monitoring was completed 48 hours each week throughout the first month of life and included feeding times, volume of intake, and number of feeding-related coughing episodes. Data was summarized using descriptive statistics, with changes in coughing throughout the first month of life evaluated using a paired t-test.

**Results:** Nineteen infants (53% female) were enrolled in the investigation at the time of abstract submission. The majority of infants (68%) coughed at least once each monitoring period, with the number of feeding related coughing episodes ranging from 0-35 times per two day data collection period. This equated to infant's coughing during an average of 15% of their feeds. No significant changes in the proportion of feeds with coughs were observed throughout the first month of life ( $p=0.13$ ).

**Conclusions:** Some coughing during feeds is likely a normal variant of development among healthy term infants.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Management of Aerodigestive Foreign Bodies during COVID-19

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### Abstract

#### INTRODUCTION:

Symptoms of COVID-19, Foreign body (FB) ingestion and aspiration may overlap. The role of COVID-19 testing in management and health care provider protection in emergency upper aerodigestive tract (UADT) endoscopy remains unclear. This study investigates the safety of performing preoperative COVID-19 tests in children presenting with emergency FB ingestion and aspiration.

#### METHODS:

A retrospective cohort study was conducted at a tertiary care pediatric hospital on children that underwent UADT endoscopy for foreign body management (FBM), from March 30th to August 31st, 2020. Clinical presentation, COVID-19 related symptoms, exposure risk, test details and test related adverse events (AEs) were reviewed.

#### RESULTS:

34 children underwent UADT endoscopy for FBM and 85% were tested for COVID-19. None had test-related AEs. 5 of 6 (83%) children with airway FB were tested for COVID-19, with only one testing positive post-operatively. 24 of 28 (86%) with an esophageal FB body were tested and all were negative. 21 of 34 (61%) presented with COVID-19 related symptoms (cough, vomiting, chest pain, sore throat, shortness of breath, difficulty breathing) or history of COVID-19 positive exposure. Among those children, 4 (19.0%) were not tested, 7 (33.3%) received test results preoperatively and 10 (47.6%) postoperatively. Adequate personal protective equipment was used during UADTE with unknown/pending results.

#### CONCLUSION:

In conclusion, this study demonstrates that most UADT endoscopy for FBM proceeded with pending COVID-19 status, even in the presence in COVID-19 related symptoms. We highlight the safety and lack of test-related AEs associated with preoperative COVID tests in this population.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Diagnostic utility of sleep oximetry in management of pediatric laryngomalacia

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### Abstract

#### Background:

Contemporary literature has examined polysomnography (PSG) as a diagnostic tool for guiding management in laryngomalacia. Yet despite being a more accessible and less resource intensive modality, the utility of sleep oximetry is not well understood due to the limitations in infants. This study aims to evaluate the utility of overnight sleep oximetry in pediatric patients with laryngomalacia by developing a scoring system to triage severity and guide clinical decision making.

#### Methods:

We conducted a retrospective review (2002-2020) of patients with a diagnosis of laryngomalacia without major co-morbidities. Data from initial sleep oximetry and post-treatment sleep oximetry were collected where available. A modified McGill Oximetry Score (MMOS) ranging I-IV (normal to severe) was created to incorporate bradycardia associated desaturation events. The pre-treatment scores were correlated with clinical presentation on initial consultation, were compared between patients treated surgically and compared with post-treatment scores.

#### Results:

Overall 80 eligible participants were included in the study. More severe symptoms on initial consultation were more likely to have higher corresponding MMOS. Patients treated with surgical intervention had higher pre-treatment MMOS. Ultimately we saw a significant decrease in the post-treatment score for patients who were treated with supraglottoplasty, which was associated with clinical improvement in symptoms.

#### Conclusion:

Herein we present a simple scoring system based on the MMOS demonstrating the utility of overnight sleep oximetry in guiding management of laryngomalacia.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

The Impact of COVID-19 on Outpatient Flexible Fiberoptic Laryngoscopy Trends in Children with Laryngomalacia

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### Abstract

**INTRODUCTION:** Flexible fiberoptic laryngoscopy (FFL) is commonly performed in the evaluation of children with stridor. As an aerosol generating medical procedure (AGMP), it requires adequate safety precautions especially during COVID-19. In this study, we investigate the impact of COVID-19 on outpatient FFL trends in children presenting with clinically suspected laryngomalacia.

**METHODS:** We performed a retrospective review of all new outpatient visits for clinically suspected laryngomalacia based on patient demographics and reasons for the encounter including stridor, feeding and breathing difficulties at a tertiary care pediatric hospital between March 30th-August 1st, 2020. FFL rates were compared with the same cohort and time period in the previous year.

**RESULTS:** 23 and 16 new patients were included in 2019 and 2020 respectively. The average age was  $4.5 \pm 5.2$  months in 2019 and  $4.95 \pm 6.7$  months in 2020. All patients in 2019 group underwent FFL compared to 14 (88%) in 2020. None of the 2020 group had a previsit COVID test. FFL protocol in 2020 included use of an N95, standard personal protective equipment, and allowing adequate time for clinic cleaning and air filtration between patients. 21 (91%) of patients in 2019 and 100% of patients in 2020 were diagnosed with laryngomalacia. Other final diagnoses in the 2019 group included: recurrent croup, chronic rhinitis and vocal cord paresis/paralysis.

**CONCLUSION:** In children with suspected laryngomalacia, FFL is still being utilized quite routinely in 2020 during the pandemic. Despite potential for COVID transmission during FFL, COVID-19 did not affect clinical decision making in the presence of added precautions.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Hemoptysis consults: What are the clinical yields and associated costs?

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### Abstract

**Introduction:** Pediatric patients present to the ED not infrequently for hemoptysis. Since there are some rare life-threatening causes of hemoptysis, ENT, pulmonology, and gastroenterology are often consulted. These services have multiple tools to evaluate causes of hemoptysis that can be costly. This study evaluates the cost of these invasive procedures in comparison to their clinical yield and utility.

**Methods:** After obtaining IRB approval, we looked at patients that presented to our Children's Hospital ED from January 2009 through December 2018 with the ICD code for "hemoptysis". We divided up the patients according to whether there was no subspecialty consult, otolaryngology consult, pulmonology consult, or gastroenterology consult. Associated cost data was obtained for each ED visit.

**Results:** There were 200 unique visits with "hemoptysis" diagnosis. ENT was consulted 29% (n=58) of those visits, pulmonology 9% (n=18), and gastroenterology 4% (n=7). Of the otolaryngology consults, 34 resulted in a procedure performed, with flexible nasopharyngoscopy and nasal cauterization as the most common. All flexible nasopharyngoscopy procedures (n=18) and EGDs (n=5) resulted as normal with no bleeding site identified. Of the 8 bronchoscopies, 5 (62.5%) resulted in identification of a bleeding source. The average charge for flexible nasopharyngoscopy was \$467.00, and the average charge of bronchoscopy was \$1,014.00.

**Conclusion:** In our study, no flexible nasopharyngoscopies showed any source of bleeding. In comparison, 62.5% of bronchoscopies from pulmonology positively identified a bleeding source. In future hemoptysis consults, if flexible nasopharyngoscopy is indicated, it may be beneficial to also consider a pulmonology consult for flexible bronchoscopy.

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## Combined 2020 Virtual Meeting Abstract Session Information

### SENTAC Abstract Session December 4<sup>th</sup> 3:15pm CST

#### Title of Paper

Pediatric Otologic Surgery: 30 Day Readmission Rates and Associated Risk Factors

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#### Abstract

##### Background:

Understanding why pediatric patients are readmitted following otologic surgery is crucial to improving post-operative outcomes and cost effectiveness. This study aims to identify the incidence and risk factors of unintended readmission in a nationally representative patient sample.

##### Methods:

The Nationwide Readmissions Database from the Healthcare Cost and Utilization Project was used to identify pediatric otologic surgeries and readmissions. Surgeries were categorized using codes from the International Classification of Diseases, Ninth Revision, Clinical Modification. Factors significantly correlated with readmission were identified using univariate and multivariate analysis using STATA/IC version 15.1. These factors included patient age, sex, income, number of chronic diseases, number of diagnoses, number of procedures, discharge location, insurance type, hospital location, and teaching status.

##### Results:

19,687 visits were identified over 20,972 procedures, with 1,086 readmissions within 30 days, for a rate of 5.52%. 667 of these readmissions were for a cause relevant to the initial procedure, for a rate of 3.39%. The most common readmission type was infection. The most common individual diagnosis upon readmission was hemorrhage complicating a procedure. Upon univariate and multivariate analysis, number of procedures, number of chronic conditions, and number of diagnoses were significantly associated with readmission.

##### Conclusion:

In this analysis of 30-day readmissions following pediatric otologic surgeries, the overall readmission rate was 5.52%, and the relevant readmission rate 3.39%. Understanding how to limit these readmissions after surgery is important to improving patient outcomes and reducing cost. Future research may be aimed at improving quality of care to reduce pediatric otologic readmissions.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Comparing HEAR-QL and the PROMIS Measures in Assessing Quality of Life in Pediatric Non-CNS Cancer Survivors receiving Ototoxic Therapy

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### Abstract

**Background:** Childhood cancer survivors (CCS) receiving ototoxic chemotherapy are at risk for hearing loss (HL) and decreased quality of life (QOL). We compared two self-report QOL measures, one developed for children with HL (HEAR-QL) and one validated in CCS (PROMIS), hypothesizing that the HEAR-QL would be more sensitive at identifying QOL challenges in CCS at risk for HL.

**Methods:** Inclusion criteria: 1) pediatric cancer diagnosis, 2) history of ototoxic chemotherapy, 3) age between 8-17 years, 4) at least 6 months from treatment completion, 5) audiogram within 1 year. Exclusion criteria: 1) central nervous system (CNS) malignancy, 2) cranial radiation, 3) surgery to the CNS, 4) intrathecal chemotherapy. Evaluable participants completed the HEAR-QL and PROMIS after routine clinic visits.

**Results:** Thirty-two individuals were evaluated. Mean age was 11.91 years (8-17), 50% were female. Over half were diagnosed with neuroblastoma (34.4%) or germ cell tumor (25%). Twelve (37.5%) received Cisplatin and 22 (68.8%) received Carboplatin. Ten had sensorineural HL (31.3%). Participants with HL had significantly lower HEAR-QL-26 Total Scale Scores ( $\mu = 62.64$ , SD: 26.57) than those with normal hearing (NH) ( $\mu = 90.11$ , SD: 7.42). CCS with NH scored significantly lower than the HEAR-QL-26 normative mean ( $\mu = 98$ , SD: 5). The PROMIS failed to identify any inferior outcomes.

**Conclusion:** The HEAR-QL was superior to the PROMIS identifying QOL deficits in CCS at risk for HL but at low risk for other CNS based late effects. The HEAR-QL should be utilized in studies striving to improve QOL of CCS with HL.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Is ABR testing in children with Autistic Spectrum Disorder who passed their universal newborn screening test necessary?

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### Abstract

**Background:** Hearing assessment in the paediatric population with Autistic Spectrum Disorder (ASD) poses many challenges as a sizeable proportion of these children need general anaesthesia (GA) for an auditory brainstem response (ABR) to confirm hearing or obtain an accurate hearing level. Our objective was to investigate the severe hearing loss pick up rate in children with ASD who passed the Universal Newborn Hearing Screen (UNHS).

**Methods:** The medical charts of ASD children with hearing concerns undergoing ABR under general anaesthesia (GA) in our institution were investigated for the past 8 years.

**Results:** From 50 patients, 4 (8%) failed the ABR. Two patients had conductive hearing loss (CHL) and two patients had sensorineural hearing loss (SNHL). Of these, 2 were known to have failed their UNHS testing (1 CHL, 1 SNHL).

**Conclusions:** In our opinion, the pickup rate of severe SNHL (2%) in ASD children is very low. We do not recommend the routine use of ABR under GA as this is a traumatizing experience for these children and does not change their management pathway.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Pediatric Bilateral Vestibular Hypofunction: A Review of 8 Cases

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### Abstract

**Introduction:** Bilateral vestibular hypofunction (BVH) is a rare but devastating condition which has been thoroughly described in the adult vestibular literature. Adult patients with BVH suffer from severe imbalance with disruption of gait, and typically require vestibular physical therapy. To date, there are no reports on BVH in the pediatric population. In this review, we provide our experience with pediatric BVH.

**Methods:** This was a retrospective chart review of a multidisciplinary pediatric vestibular clinic at a tertiary care center. A total of 474 pediatric patients with balance-related complaints were evaluated over a 3-year period. Medical records were reviewed, inclusive of relevant history, physical therapy evaluation, audiometric, and vestibular testing results. All patients with BVH were included in this review, defined as bilateral low gain on video head impulse testing(vHIT).

**Results:** Seven subjects(1.5%) were identified, five females and two males, with mean age of 4.3 years(2.5-6;SD 1.5y). Most subjects had other diagnoses, including autism(1), CHARGE syndrome(2), Waardenburg syndrome(1), and congenital CMV(1). Four had developmental/motor delay; one had hypotonia. Two had identifiable inner ear anomalies. Six subjects had profound sensorineural hearing loss (SNHL). Two-thirds performed poorly on developmental motor scales, and six were referred for outpatient physical therapy.

**Conclusions:** Pediatric BVH is a rare cause of imbalance. While a third of adult BVH is idiopathic, the majority of pediatric BVH is associated with an identifiable syndrome. Nearly all patients have concurrent profound SNHL, as opposed to the rate of 50% among adults, though most do not have identifiable inner ear anomalies.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Complications in Pediatric Acute Mastoiditis: HCUP KID Analysis

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### Abstract

**Objective:** A small proportion of children with otitis media develop acute mastoiditis, which has the potential to spread intracranially and result in significant morbidity and mortality. The aim of this study was to evaluate the incidence and management of complications related to pediatric acute mastoiditis utilizing a national database.

**Design:** Retrospective review of the 2016 HCUP KID inpatient database.

**Subjects and Methods:** ICD-10 code H70.XXX was utilized to retrieve records for children admitted with a diagnosis of mastoiditis. Data included patient demographics, intracranial infections, procedures (middle ear drainage, mastoidectomy, and intracranial drainage), length of stay (LOS), and total charges.

**Results:** 2083 children aged <21 years were identified with a diagnosis of acute mastoiditis. Complications included subperiosteal abscess (6.91%), intracranial thrombophlebitis/thrombosis (5.33%), intracranial abscess (3.89%), otitic hydrocephalus (1.15%), encephalitis (0.91%), subperiosteal abscess with intracranial complication (0.62%), and meningitis (0.29%). Children with intracranial abscesses were more likely ( $p < 0.001$ ) to undergo myringotomy +/- ventilation tube insertion (64.2%), mastoidectomy (54.3%), mastoidectomy with ventilation tube or myringotomy (43.2%), intracranial drainage procedure (35.8%), or all three key procedures (14.8%). Children with any type of intracranial complication had a significantly longer LOS ( $p < 0.001$ ) and higher total charges ( $p < 0.001$ ). Both a diagnosis of bacterial meningitis and undergoing an intracranial drainage procedure ( $p < 0.001$ ) contributed significantly to LOS and total charges.

**Conclusion:** Patients with intracranial complications are more likely to undergo surgical procedures; however, there is still wide variability in practice patterns, illustrating that controversies in the management of complications of otitis media persist.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

The hearing aid effect in 2020. A cross-sectional survey-based study.

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### Abstract

#### Background:

The hearing aid effect is a negative perception towards hearing assistive device (HD) users. It remains one of the main reasons behind parents and children's refusal to use them. The object of this study is to determine the current perception towards HD users and factors associated with it.

#### Method:

A 30-items photo-based survey was created to measure the participants perception of individuals wearing HD in comparison to healthy individuals (H) and to Disabled Individuals (D). The survey was validated with intra-rater reliability of 86%. Afterward a cross-sectional study was conducted by approaching the population who were visiting one of the largest shopping centers in a metropolitan city to participate in the survey. Demographics including age, gender, and educational background were collected.

#### Results:

517 participants fully answered the survey. Nearly two-thirds of the participants (59.7%) did not consider HD as an individual who needed assistance had a disability in comparison to healthy individuals. Interestingly, the participants from generation X & Z had a statistically significant better perception of health of individuals with HD (63.1%, 59% respectively) compared to participants from the Baby Boomers generation (54.3%). The majority of participants who considered HD is a handicap compared to healthy individuals (79.9%) did not have a family member with a HD.

#### Conclusion:

The stigma of wearing hearing assistive devices is significantly improving with time and the younger generations are not identifying it as disability. This is an important point to highlight while counseling parents and young adults who are candidates for HD.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Otitis Media with Effusion in Children with Down Syndrome: A Systematic Review of Treatment Options and Outcomes

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### Abstract

**Background/aim:** There is a paucity of evidence in regards to the preferred management protocols used in otitis media with effusion (OME) in this particular subset. Our study sought to assess the current state of uncertainty concerning the different methods used for the treatment of OME in children with Down Syndrome.

**Review methods:** A systematic review of published records evaluating the treatment of OME in Down syndrome children prior to September 2020 was conducted. Studies were identified using an electronic search of medical databases: PubMed, Google Scholar, CINAHL, Scopus and Medline. Data extraction was performed over 3 stages: initial screening of titles based on inclusion and exclusion criteria, review of suitable abstracts and subsequent full-article analysis of selected records for data extraction.

**Results:** Twenty-seven articles were found eligible for this review. Based on our preliminary findings, studies show conflicting outcomes in regards to the different treatment options used for OME in patients with Down syndrome. Of those evaluating PETs, some studies report pronounced complication rates and recommend using a conservative approach unless hearing loss is considered severe and/or complications are present. In contrast, more recent studies show significantly reduced complication rates and improved hearing outcomes with earlier intervention and certain adaptations to PET. Patients who were treated with conventional hearing aids ended up having grommet insertions eventually.

**Conclusion:** As to the treatment option with the most favorable outcomes for OME in children with Down syndrome, PETs showed the lowest complication rates and highest improvement rates.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Impact of variation in newborn hearing screening on timing of diagnosis of Auditory Neuropathy Spectrum Disorder

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### Abstract

**INTRODUCTION:** Auditory Neuropathy Spectrum Disorder (ANSD) accounts for 10% to 15% of pediatric hearing loss. In most cases, otoacoustic emissions (OAE) are present as the outer hair cell function is normal, and the auditory brainstem response (ABR) is abnormal. Newborn hearing screen (NBHS) is completed using OAEs or ABR's depending on the institution. Because OAEs are normal in ANSD, NBHS done solely with OAE can miss patients with ANSD.

**OBJECTIVES:** To assess the age of diagnosis of ANSD and other comorbidities in patients who had NBHS with OAE or ABR.

**METHODS:** This is a retrospective study of patients diagnosed with ANSD at two tertiary pediatric hospitals from 1/01/2010 to 12/31/2018. Data recorded included patient demographics, type of NBHS, NICU stay, and age at ANSD diagnosis.

**RESULTS:** 264 patients were diagnosed with ANSD. Of those, 123 (46.6%) were female, and 141 (53.4%) were male. Ninety-seven (36.8%) were admitted to NICU and mean stay was 6.98 weeks (STD=10.7; CI=4.8 - 9.1). The majority (244, 92.4%) of patients had NBHS with ABR, but 20 (7.5%) had OAEs. Patients who had ABR for NBHS were diagnosed earlier with ANSD than patients who had OAE ( $p=0.0397$ ). The mean age at diagnosis (in weeks) of ANSD for patients who had ABR was 14.1 (CI=10.7-17.6) and for OAE was 27.3 (CI=15.2-39.3).

**CONCLUSION:** Patients with ANSD who had NBHS with ABR were diagnosed earlier than those with OAE. In order to facilitate earlier diagnosis of ANSD, especially in setting of risk factors, ABR should be considered for NBHS.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Repeat Tympanostomy Tubes in Children with Down syndrome

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### Abstract

#### Background:

Children with Down syndrome (DS) have a higher incidence of tympanostomy tubes (TTs) than non-syndromic children. While multiple studies have identified factors that predispose patients to receive repeat TTs, there have been no studies investigating factors that are associated with multiple TTs specifically in the DS population.

#### Methods:

A retrospective case-control study was performed on consecutive DS children from 2007 to 2018 with first TT procedure data at a large tertiary children's hospital and at least 27 months since first TT.

#### Results:

277 patients met the inclusion criteria. Repeat TT rate was 61.4%. Having an indication of chronic otitis media with effusion (COME) at time of first TT was an adjusted risk factor for increased rate of repeat TT (OR: 2.01, 95%CI: 1.15-3.51, p=0.014) while being older at first TT was an adjusted protective factor for decreased rate of repeat TT (OR: 0.84, 95%CI: 0.74-0.95, p=0.004). Adenotonsillectomy at or before first TT was not an adjusted protective factor for decreased rate of repeat TT (OR: 0.915, 95%CI: 0.448-1.872, p=0.809) and bilateral intra-operative fluid was a marginally significant adjusted risk factor for repeat TT (OR: 1.97, 95%CI: 0.99-3.90, p=0.054).

#### Conclusions:

Children with DS were more likely to undergo repeat TT if they were of younger age and if the logged indication for surgery was COME. Similar to other DS studies, the repeat TT rate for DS patients was high at 61.4%. Prospective studies are warranted to more precisely investigate factors associated with repeat TTs in this unique patient population.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Social Isolation and Loneliness in the Hearing-Impaired Pediatric Population: A Scoping Review

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### Abstract

**Objective:** To review existing publications in order to evaluate the effect of hearing loss on social isolation and loneliness in the pediatric population.

**Methods:** Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Scoping Review (PRISMA-ScR) guidelines were followed. Eight databases were searched. Studies were independently screened and analyzed by 2 reviewers. Publications were included if pediatric hearing-impaired individuals, and social isolation or loneliness were studied. Discrepancies were resolved by a team of 5 reviewers.

**Results:** Thirty-three studies were included in this review. Sixty percent of studies (12/20) found that hearing loss was related to loneliness and 64.7% found that children with hearing loss experienced more social isolation (11/17). The Asher Loneliness and Dissatisfaction Questionnaire was commonly used to assess loneliness. No commonly used tool for assessing social isolation was found. Six articles found that school type was not associated with loneliness. Difficulty communicating was the most mentioned factor leading to loneliness and social isolation. Frequent recommendations to improve social integration included facilitating interactions with the hearing-impaired and educating the non-hearing-impaired to normalize the disability.

**Conclusion:** The majority of studies found that hearing impairment results in a higher prevalence of social isolation and loneliness. However, an association cannot be definitively claimed due to lack of uniform assessment tools. This review emphasizes the need for standardized methods to assess loneliness and social isolation and highlights methods to improve social integration for the hearing impaired.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Correlation of Quality of Life with Speech and Hearing Performance After Cochlear Implantation

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### Abstract

**Introduction:** There is a general consensus that cochlear implants (CI) serve as an effective means of hearing rehabilitation in pediatric patients with profound deafness (1). Over time, CI diminish the negative effects of deafness on a child's quality of life (QOL), bringing it to levels comparable to their normal-hearing peers (2,3). The Speech Intelligibility Rating (SIR) instrument is a 5-point scale used to describe the speech performance of patients. In this scale, 1 represents "pre-recognizable words in spoken language" and 5 represents "connected speech is intelligible to all listeners" (4). The Categories of Auditory Performance (CAP) is a physician-rated instrument that categorizes a patient's ability to understand and to respond to their auditory environment. This 9-point scale ranges from 0, "no awareness of environmental sounds or voice," to 9, "use of phone with unknown speaker in unpredictable context" (4,6). While there are existing studies on the clinical experience of post-CI patients in Saudi Arabia, those studies did not investigate the correlation to auditory and speech performance. We aimed to study the changes in QOL and correlate it with CAP and SIR scores.

**Methods:** Cross-sectional study from November 2018 to February 2020. The study was conducted in the otolaryngology department at a tertiary referral center on patients aged 16 years or younger who had received cochlear implants (CI). Parents were asked to complete the Glasgow Children's Benefit Inventory (GCBI) questionnaire. CAP and SIR assessment results were obtained from speech therapists at our center. GCBI results were correlated with objective data from the CAP and SIR assessment tools.

**Results:** A total of 70 patients were included. The median age at implantation was 3 years and 4 months. The mean GCBI score was 52.23 (SD = 23.98). We found a statistically significant correlation of the total GCBI questionnaire score with the CAP score, ( $r = 0.40$ ), with a p-value of 0.008 (correlation was significant at the 0.01 level), though no correlation was found with the SIR score. The total GCBI score did not correlate with the age of implantation.

**Conclusions:** This study provided further justification of the need to integrate QOL measures when evaluating the outcomes of an intervention on patients. Incorporating QOL assessment tools into CI outcome measures, along with auditory and language performance assessments, generates a more comprehensive understanding of patient progress.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Keeping Pediatric Audiology Patients on Track during COVID-19

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### Abstract

#### BACKGROUND

The COVID-19 pandemic created unprecedented challenges for pediatric audiology patients and their families. The current study describes how two pediatric hospital systems utilized different approaches to patient care provision during the pandemic.

#### METHODS

Audiologists from two pediatric hospital systems compared approaches to several patient care topics during the pandemic. Topics included size of hospital system, number of audiologists, prioritization of visit types, use of telehealth, number of patients seen, no-show rate, parent and sibling limitations in clinic, and coordination with Early Hearing Detection and Intervention (EHDI) programs.

#### RESULTS

Hospital system 1 employs 10 audiologists at one location. The audiologists' work hours remained stable throughout the pandemic. Audiologists provided services to patients with any hearing issue, prioritizing infants who failed the newborn hearing screen and patients with hearing aid or implant issues. Services were provided in person, via telehealth, and phone. No-show rates increased. One parent and no siblings were allowed in clinic.

Hospital system 2 employs 27 audiologists across 8 locations. For 6 weeks during the pandemic, 5 of the 8 locations were closed and work hours of the 27 audiologists were cut 75%. Audiologists provided services to patients with urgent hearing aid or implant issues, and newborn hearing screening follow-up services. Services were provided in person. No-show and cancellation rates increased. One parent and no siblings were allowed in clinic.

#### CONCLUSION

Experiences from two pediatric hospital systems provide a model for continued excellent pediatric audiology patient care despite unprecedented challenges resulting from the COVID-19 pandemic.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

"We didn't know that our children needed hearing aids!"

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### Abstract

#### Background

Microtia (congenital hypoplasia of the pinna) and aural atresia (both stenotic and complete atretic condition of the external auditory canal) can affect physical appearance, hearing, speech and learning that could negatively impact self-esteem and overall quality of life; these children have unilateral hearing loss. In 2018, the Texas Children's Hospital Pediatric Otolaryngology division sponsored the first annual Microtia and Atresia Celebration to create awareness and an opportunity for patients and families to interact with members of the multidisciplinary care team and other affected families. Resources for hearing rehabilitation and surgical reconstruction options were provided at this event

#### Methods

At the second event in 2019, a written survey was conducted among the participants. The questionnaire included a total of 5 questions: 1) does the celebration help you connect with other families; 2) help you connect with the healthcare team; 3) were the lectures helpful; 4) would you return next year; and 5) would you recommend the event to others; Opportunities for comments were also provided under each question.

#### Results

14 of 28 families responded and they all appreciated the opportunity to connect with other families as well as their medical team; they also found the lectures helpful, would return to the event next year and would recommend Microtia and Atresia Celebration to others. They specifically were appreciative of the knowledge that hearing aids were for children with unilateral hearing loss.

#### Conclusion

Our survey indicated that all of the respondents appreciated the education about the disease, benefit of hearing aids and the opportunity to communicate with their medical team and with other patient families. Texas Children's caregivers could communicate the many ways we can help, and it allowed for a positive impact and quality improvement in community involvement.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Development and Impact of an Interdisciplinary Hearing Team Clinic

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### Abstract

When a child is diagnosed with hearing loss, families are often left with several questions and a longing for guidance regarding their child's care. Many families struggle to receive collaborative care in a coordinated and timely method. Research has shown initial counseling and care regarding hearing loss has a high impact on positive outcomes; therefore, it is important to address the management of hearing loss in a timely, impactful, and collaborative way. This presentation will discuss how Arkansas Children's Hospital has addressed these needs by developing an Interdisciplinary Hearing Team Clinic Model for children who are diagnosed with hearing loss. This model includes collaboration between Otolaryngology, Audiology, Speech and Language Pathology, Psychology, Genetics, Family Support, and Early Intervention. The presentation will discuss the needs and research that led to the development of the clinic, as well as the implementation and outcomes of the clinic. Specific information will be provided on how to develop a multidisciplinary hearing team clinic, and the challenges that may be faced. Several case studies will be presented to demonstrate the enhanced value of an interdisciplinary team model, and how this type of clinic yields benefit to both families and providers. Participants will be able to:

- Identify the need for an interdisciplinary hearing team clinic
  - Delineate how to implement an interdisciplinary hearing team clinic in their practice
  - Evaluate desired goals and outcomes for patients and families who attend the team clinic
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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Utilizing an Easy to Read Magnet Card to Improve Parental Management of Tympanostomy Tube Complications: A Retrospective to Prospective Comparison Study

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### Abstract

**Background:** ENT departments receive a large number of phone calls regarding otorrhea associated with tympanostomy tubes (TT). Many phone calls and healthcare visits may be avoidable by improving patient education processes.

**Methods:** Children undergoing TT placement at the University of Rochester Medical Center by two pediatric otolaryngologists were included in this study. The control group received standard discharge instructions from January-April 2019 whereas the experimental group, from January-April 2020, received standard discharge instructions and an educational refrigerator magnet with language created by a health literacy specialist. Clinical outcomes including number of phone calls and healthcare visits related to otorrhea were compared between groups.

**Results:** 165 patients from the retrospective group were identified and compared to 131 patients in the prospective group. 2020 data was impacted by COVID-19 pandemic occurring during the follow up visit window, some visits were cancelled or done via telehealth. There were no significant differences between groups for phone calls, urgent care, PCP or emergency visits. Those patients with history of prior TT were more likely to not call the ENT department ( $P < 0.01$ ). Patients who identified as white ethnicity were more likely to call ENT postoperatively ( $P < 0.01$ ).

**Conclusion:** Further work is needed to positively impact patient understanding of how to manage TT. Other mixed methods of teaching should be explored to continue to promote knowledge retention and improve outcomes.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Bullying and Children with Hearing Loss: A Scoping Review

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### Abstract

**Background:** Bullying is a prevalent issue and can lead to long-term health consequences. The goal of this review is to evaluate the published research regarding bullying and children with hearing loss (HL).

**Methods:** The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping review (PRISMA-ScR) statement was used as the guideline for conducting this review. Seventy records underwent the initial title-abstract screening, 33 underwent full text review, and 23 studies met inclusion criteria. During the data extraction process, an additional 4 were excluded, resulting in a total of 19 studies evaluated.

**Results:** Of the 19 studies assessed, 9 case-control studies compared bullying victimization between children with HL and their hearing peers. Of those, 7 studies reported that HL is associated with increased victimization. 2 case-control studies found that HL is associated with decreased bullying perpetration. Notably, bullying in children with HL was not found to be associated with a visible sign of disability, such as a hearing assistive device. Rather, variables such as communication difficulty, peer support, and parental support are more likely to mediate bullying in children with HL.

**Conclusion:** Children with HL have a higher risk of bullying victimization and may bully others less often than their hearing peers. Studies described the significant health consequences of bullying in children with HL, including sleeping issues and anxiety. These consequences may have implications for the patients' overall HL management. Additional research regarding bullying interventions and prevention in this population should be conducted.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Contralateral Hearing Outcomes in Children With Unilateral Enlarged Vestibular Aqueduct

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### Abstract

**Background:** While an enlarged vestibular aqueduct (EVA) is the most commonly recognized radiographic entity identified in children with sensorineural hearing loss, hearing manifestations vary widely in laterality, severity and progression. Although it most often presents bilaterally, previous studies have demonstrated varying hearing outcomes in children with unilateral EVA. In this study, we endeavored to determine whether contralateral (non-EVA) ear outcomes are associated with vestibular aqueduct size in children with unilateral EVA.

**Methods:** A retrospective chart review was performed on children with unilateral EVA at a single academic medical center. Pure tone audiometry (PTA) at high (<4000 dB) and low (>4000 dB) frequencies for air (AC) and bone conduction (BC) were used to assess hearing outcomes in the “non-EVA” ear. Linear mixed effects models were used to evaluate the relationship between VA midpoint or operculum size and PTA in the non-EVA ear.

**Results:** There were 24 children identified with unilateral EVA with mean age at first audiogram of 7.9 (0.7-23.8) years. Mixed linear effects model revealed that there was no significant association between VA midpoint or operculum size and hearing through AC or BC across all frequencies. Further, the EVA did not significantly impact the non-EVA ear over time. No p-values reached statistical significance ( $p>0.05$ ).

**Conclusion:** The present study demonstrates that EVA size does not correlate with hearing loss in the non-EVA ear, suggesting that the ears may function independently. This evidence may be clinically useful in prognostication of future hearing outcomes in children with unilateral EVA.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Adapting and Innovating: Management of patients with hearing loss during a pandemic

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### Abstract

It goes without saying that novel coronavirus brought a new set of challenges to both our patients and their managing healthcare professionals. Many of us are still determining the best way to efficiently address these challenges in an ever-changing environment. To further complicate these challenges, patients with hearing loss no longer have adequate access to effective communication due to face mask and social distancing requirements. Additionally, audiologists rely heavily on in-person patient management with very limited virtual options available. Although our close counterparts, speech-language pathologists, can provide virtual care, they too, are facing challenges in providing care to their patients with hearing loss. This presentation will discuss the on-going barriers and creative strategies implemented by audiologists and speech-language pathologists at Arkansas Children's Hospital.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Insurance Disparities in Children With Bilateral Enlarged Vestibular Aqueduct

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### Abstract

**Background:** Enlarged vestibular aqueduct (EVA) is the most common radiographic finding identified in children with sensorineural hearing loss. Though there is a paucity of evidence regarding insurance status and EVA, previous studies have demonstrated that children with low socioeconomic status or who have Medicaid insurance, may have overall poorer hearing outcomes.

**Methods:** A retrospective chart review was performed on children diagnosed with bilateral EVA in a single academic medical center. Pure tone audiometry (PTA) at high (<4000 dB) and low (>4000 dB) frequencies for both air (AC) and bone conduction (BC) was used to assess hearing in children with Medicaid and commercial insurance.

**Results:** 35% (n=11) and 65% (n=20) of EVA patients used Medicaid and commercial insurance respectively. There were no significant differences in the mean age at first audiogram ( $6.3 \pm 4.9$  for Medicaid vs.  $6.7 \pm 3.5$  for commercial;  $p=0.834$ ), or vestibular aqueduct size in either the right or left ( $p>0.05$  for all). There were significant differences in AC and BC in both high and low frequencies in the right ear ( $p=0.019, 0.031, 0.002, 0.008$  respectively). However, there were no significant differences in AC or BC in the left ear ( $p>0.05$  for all).

**Conclusion:** We have demonstrated that children with Medicaid insurance may have poorer hearing at presentation, despite presenting at similar ages and EVA sizes. Further, our study demonstrates that children with bilateral EVA may present asymmetrically.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Cochlear Erosion and Diffuse Bacterial Labyrinthitis due to Infected Cochlear Implant

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### Abstract

#### Background

Infectious complications in patients with cochlear implants have become rare with proper immunizations and technological advancements. We present an unusual infectious complication in a pediatric cochlear implant recipient.

#### Case Report

A 16-year-old female with bilateral sensorineural hearing loss and normal inner ear anatomy underwent bilateral sequential cochlear implantation over ten years ago. She had ear tubes as a toddler but no otitis or other middle ear issues after age 5. She presented to an outside otolaryngologist with otorrhea and otalgia. She was diagnosed with acute myringitis and otitis media and prescribed oral antibiotics and drops. Her symptoms progressed, and she was ultimately diagnosed with meningitis. A CT scan demonstrated unilateral mastoid and middle ear fluid with implants in proper position. She was treated only with IV antibiotics without surgery. There was intermittent drainage and dizziness. Repeat imaging four months later revealed extensive lytic changes with erosion of the otic capsule and extrusion of the electrode array into the middle ear. She underwent a left subtotal petrosectomy with cochlear implant removal and external auditory canal closure. The cochlear promontory was nearly completely eroded, and the cochlea was filled with granulation tissue. Cultures grew *Pseudomonas aeruginosa*. Postoperatively, she was placed on prolonged culture-directed antibiotics and has done well.

#### Conclusion

This extremely unusual infectious complication after cochlear implantation demonstrates how crucial it is that a specialist evaluates any otologic abnormality in a cochlear-implanted patient. Prompt surgical management is required in cases of mastoiditis in patients with cochlear implantation to prevent further complications.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Abstract Session 4

December 5<sup>th</sup> 9:00am CST

#### Title of Paper

Airway Anti-inflammatory Regimen Helps Intubated Pediatric Patients Achieve and Maintain Extubation

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#### Abstract

##### Background

In mechanically ventilated patients, failed extubations may incur higher rates of complications, mortality, and costs. This study assesses whether a concomitant weeks-long regimen of anti-inflammatory medications used for aerodigestive diseases leads to persistent extubation in children who have failed prior extubation attempts.

##### Methods

Retrospective analysis of intubated pediatric patients at a tertiary care medical center who failed prior extubation and received (study group) or did not receive (control group) the anti-inflammatory medication regimen. The regimen consisted of an H1-antagonist, H2-antagonist, proton-pump inhibitor, inhaled steroid, macrolide antibiotic, and leukotriene inhibitor. Analyses included demographics, intubation duration, extubation outcome, and extubation attempts. Statistical significance was set a priori at  $p < 0.05$ .

##### Results

Of 36 patients, 18(50%) received the medication regimen and comprised the study group. There were no significant differences in demographics, intubation days or comorbidities between study and control groups. Compared to controls, sustained extubation was achieved in a higher proportion of children in the study group (83% vs 56% controls,  $p = 0.047$ ). In the same cohort, extubation failure in 3/18(17%) patients was attributed to: a previous neck mass leading to upper airway collapse, rhinovirus, and a vascular tumor. Extubation for the duration of the admission was achieved in 13/18(73%) of the study group, compared to 1/18(10%) of the control group ( $p < 0.001$ ).

##### Conclusion

Intubation with mechanical ventilation incurs high cost and resource-utilization. In this critical condition, children are at risk for significant morbidity and mortality. This pilot study suggests a regimen of common aerodigestive anti-inflammatory medications is associated with higher rates of achieving and maintaining extubation.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Safety analysis of high dose topical epinephrine in pediatric laryngeal surgery

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### Abstract

**Introduction:** Epinephrine is an  $\alpha \beta$  agonist used in management of cardiac arrest, anaphylaxis, croup, and asthma. It has also been readily used in the nasal airway for topical hemostasis, but there are concerns for hemodynamic and cardiac instability with its use for airway surgery. Supraglottoplasty (SGP), routinely performed for severe laryngomalacia, requires topical vasoconstriction classically achieved with oxymetazoline. As there are limited safety data on topical epinephrine in laryngeal surgery, we assessed hemodynamic effects of epinephrine use in pediatric patients undergoing SGP.

**Methods:** Retrospective chart review was performed for patients undergoing SGP with use of topical epinephrine 1:1000 for vasoconstriction from 12/1/2017 - 12/31/2019. Anesthetic records were examined for heart rate and blood pressure parameters. Patient data were collected on comorbidities, demographics, and complication rate.

**Results:** Over 25 months, 75 patients underwent SGP with topical epinephrine. There were no perioperative cardiac events. Only one child had any notable (>10%) change in heart rate following application of epinephrine. All patients were monitored overnight with no cardiac complications.

**Conclusions:** Topical epinephrine is a potent vasoconstrictor which is safe to use in pediatric laryngeal surgery even at a high concentration. Despite concerns for cardiac and hemodynamic changes, epinephrine applied topically in patients undergoing SGP appears to be a safe alternative to oxymetazoline. Further work to assess the systemic absorption of topical epinephrine can verify this safety profile.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Diagnostic considerations prior to pediatric tracheocutaneous fistula closure

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### Abstract

**Introduction:** An airway assessment often occurs prior to tracheocutaneous fistula (TCF) closure in children. Bronchoscopy (MLB) with or without fistula-occluded polysomnography (PSG) helps determine candidacy and localize potential obstruction. To date, little has been published on MLB or PSG findings in children before surgically closing a TCF.

**Methods:** A case series with chart review of children between 2017 and 2020 who underwent repair of a TCF after tracheostomy decannulation.

**Results:** Thirty-six children were included for review. Mean age was 5.9 years (95% CI: 4.5-7.3), 58.3% were male, and 50% had chronic lung disease. Surgery occurred 13.3 months (95% CI: 11.9-14.8) after decannulation, with 80.6% by primary closure and 19.4% by secondary intention. There was one unsuccessful closure and two patients (5.6%) presented with a postoperative complication. An MLB was performed in 97.2% of children, where 22.9% identified supraglottic pathology, 11.4% had grade 2 subglottic stenosis, and 11.4% had difficult exposure of the larynx. Further, one child had a non-obstructing subglottic cyst, one had a supraglottoplasty for redundant arytenoid mucosa, and two children had suprastomal granulomas requiring removal. A PSG was obtained in 36.1%, with a mean Apnea-Hypopnea Index of 2.4 events/hour (95% CI: 0.9-3.9), nadir Oxygen saturation of 90.5% (95% CI: 87.9-93.0), and peak end-tidal CO<sub>2</sub> of 46.1 mmHg (95% CI: 43.7-48.5).

**Conclusion:** The selection of candidates for pediatric TCF closure requires careful evaluation of the airway. Surgeons should be familiar with the potential findings on MLB and PSG prior to closure.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Characterizing Dysphagia in Pediatric Patients with True Vocal Fold Dysfunction

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### Abstract

**Background:** Contrary to the adult population, swallow function in pediatric patients with unilateral or bilateral vocal fold dysfunction is not well characterized in the current literature.

**Methods:** Retrospective chart review

**Results:** Eighty-nine pediatric patients were identified. 47% female, 64% Caucasian, mean age 4.6 years, standard deviation (SD) 5.5 years. The most common etiology was cardiothoracic surgery (58.4%). Sixty-seven patients (75.3%) had unilateral disease. 80.6% had complete paralysis, 83.6% left-sided. Patients with unilateral disease were more likely to present with dysphonia than bilateral disease 40.3% versus 9.1%. Patients with paralysis were more likely to fail their MBS compared to paretic patients (59.4% versus 46.6%). 54% of children with bilateral vocal fold impairment had penetration or aspiration on initial swallow study compared with 57% of children with unilateral paralysis/paresis. MBS revealed silent aspiration (9.1% bilateral, 28.3% unilateral), aspiration (36.4% bilateral, 20.9% unilateral) and penetration only (4.5% bilateral, 7.5% unilateral). Patients with paralysis were more likely to fail their MBS compared to paretic patients (59.4% versus 46.6%). Of the 43 children who demonstrated aspiration on their initial MBS, 10 patients showed complete resolution on their second study and 7 patients on their third study (total 39.5%).

**Conclusion:** Dysphagia is not an uncommon presenting symptom in pediatric patients with vocal paralysis or paresis. However, silent aspiration on MBS is more common in unilateral disease. A significant percentage of pediatric patients who fail their initial MBS study improve.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Pediatric laryngeal sarcoma: systematic review and pooled analysis

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### Abstract

#### Background:

Soft tissues sarcoma is a diverse tumor class accounting for about seven percent of childhood malignancies, but very rarely affects the larynx. Although new treatment developments during the past decades have improved overall survival significantly, it remains unclear how sarcoma within the larynx behaves compared to other sites. To our knowledge, no analyses have previously looked at outcomes related to pediatric sarcoma within the larynx specifically.

#### Methods:

A structured literature review following PRISMA guidelines was carried out. Demographic data, tumor site, associated disease, treatment and survival, recurrence, and metastatic status were collected and analyzed.

#### Results:

The search identified 37 patients age 17 or younger with pathologically proven sarcoma of the larynx reported between 1980 to present. The median age was 11 with a range of 0-16 years. The majority of patients were male (79%) and the most common histological subtype was rhabdomyosarcoma (69%) followed by synovial sarcoma (19%). The most common laryngeal subsite affected was the supraglottis (62%). Treatment regimens varied with the majority of patients receiving multimodal therapy. Two patients were known to succumb to their disease. Overall survival was not statistically impacted by tumor site, treatment strategy, histology or gender.

#### Conclusion:

Soft tissue sarcoma is rarely found in the pediatric larynx. While mortality was minimal, reported follow-up was not often long-term making it difficult to estimate overall survival. This underscores the need for high-quality reporting of rare tumor varieties, possibly by means of streamlined online reporting systems.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Does Injection Laryngoplasty Improve Health-Related Quality of Life in Children with Dysphagia?

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### Abstract

**Purpose:** To determine whether injection laryngoplasty (IL) in children improves Infant and Toddler Quality of Life Questionnaire-47 (ITQOL-47) scores.

**Methods:** 90 patients seen at a tertiary children's hospital with dysphagia concerning for type 1 laryngeal cleft (LC) from August 2015- March 2020 were offered participation in an observational survey study (no exclusions). Parent(s) completed the ITQOL-47 on enrollment and at 1 and 4 months post-operatively. Scores ranged from 0-100, with greater scores indicating better health. Age at laryngoscopy, sex, and operative details were recorded. Statistical tests included Wilcoxon signed-rank or rank-sum tests, t-tests, linear regression, Spearman's rank correlation, and Cox regression.

**Results:** 86 participated (4 declined). 40.7% were female. Median age was 1.5y (range 2.9m-7.0y). 72.1% underwent IL. The ITQOL-47 was completed at enrollment, 1m, and 4m for 73, 32, and 36 participants, respectively. Overall, improved Physical Abilities scores at 1m (median 89 vs 83,  $p=0.027$ ) and 4m (median 89 vs 83,  $p=0.035$ ) and Discomfort and Pain (mean 75 vs 69,  $p=0.23$ ) and Temperament and Moods (median 81 vs 75,  $p=0.045$ ) scores at 1m. Participants who underwent IL had greater improvements in Parental Impact-Emotional scores at 4m (mean change 19 vs 11,  $p=0.029$ ). 8 participants eventually underwent formal repair of LC; repair was associated with lesser Global Behavior scores at 1m (HR: 0.971,  $p=0.040$ ) and Overall Health scores at 4m (HR: 0.961,  $p=0.038$ ).

**Conclusions:** Participants who underwent IL experienced a slightly greater improvement in ITQOL-47 scores. Future research could target whether scores may predict eventual need for formal repair.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Feasibility and efficiency of laryngeal mask airway for children undergoing adenotonsillectomy

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### Abstract

**Introduction:** Intubation via endotracheal tube(ETT) remains the standard approach during adenotonsillectomy(TA). Management via laryngeal mask airway(LMA) for TA has been shown to be feasible with comparable exposure and decreased postoperative bronchospasm. This study investigates the efficiency and recovery using LMA vs. ETT for TA.

**Methods:** A retrospective chart review was performed for children age three years or older undergoing TA or adenoidectomy over three years. Demographic information included age and gender. Intraoperative times for induction, surgery, and emergence were recorded. Additionally, peak end tidal carbon dioxide(ETCO<sub>2</sub>) and minimum oxygen saturation(SaO<sub>2</sub>) were extracted. Postoperative data included recovery time, minimum SaO<sub>2</sub>, requirement of nebulizers, and maximum pain scores.

**Results:** 249 patients were reviewed, 196 managed via ETT and 53 via LMA. No children required LMA to ETT conversion. Induction time was one minute faster with LMA (9 vs. 10 minutes, p=0.02). Surgical times were similar in both groups (LMA 14 vs. ETT 13 minutes, p>0.05). Emergence time was less in patients managed with LMA (3 vs. 7 minutes, p<0.0001). Recovery room time and pain scores were similar in both groups. Subset analysis of children undergoing TA revealed more rapid emergence (3 vs. 6 minutes, p<0.0001) and less time in recovery with LMA (107 vs. 124 minutes, p=0.03). Nebulizers were used in 5.1% and 1.9% of patients managed with ETT and LMA respectively.

**Conclusions:** LMA is feasible for children undergoing TA. The use of LMA reduces induction and emergence time. In children undergoing TA, the use of LMA predicts a more rapid discharge.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Supraglottoplasty as a Potential Treatment for Refractory Diaphragmatic Flutter

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### Abstract

Diaphragmatic flutter (DF) is a disorder rarely seen in the infants and children. It is characterized by rapid diaphragmatic contractions (35-480/min) during inspiration, expiration, or both. Respiratory flutter (RF) syndrome involving DF, laryngomalacia, gastroesophageal reflux disease (GERD), and dysphagia has also been described. Treatments for DF include diazepam, chlorpromazine, phrenic nerve crush, and positive pressure ventilation. We report a case of a full-term infant born via vaginal delivery with normal Apgar scores who experienced immediate abnormal diaphragmatic movement with respiratory rates of 60-100/minute requiring non-invasive positive pressure ventilation for respiratory insufficiency. Poor feeding and weight gain were observed due to dysphagia. Flexible laryngoscopy revealed only mild laryngomalacia and edema. Polysomnography revealed severe obstructive sleep apnea with an apnea-hypopnea index of 50/hour. Ultrasound of the diaphragm, MRI brain, and MRI cervical neck were normal, but chest fluoroscopy revealed symmetric “pulsatile” diaphragmatic excursion suggestive of diaphragmatic flutter. The patient failed to improve on chlorpromazine and had worsening inspiratory stridor. Supraglottoplasty to release the bilateral aryepiglottic folds and reduce the arytenoid tower mucosa was performed. Bronchoscopy revealed mild tracheomalacia and a right upper lobe tracheal bronchus. The patient was then weaned from supplemental oxygen, demonstrated a normal breathing pattern, and fed by mouth ad lib by post-operative day five. Subsequent overnight pulse oximetry was normal. In the setting of DF, laryngeal inflammation, dysphagia, and laryngomalacia, the infant’s lack of improvement with chlorpromazine and dramatic improvement following supraglottoplasty suggests that DF may be more closely linked to dynamic upper airway physiology than previously appreciated.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Novel Targets in the PI3K and RAS Pathways for the Treatment of Lymphatic Malformations of the Head and Neck

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### Abstract

**Background:** Lymphatic malformations (LMs) are rare congenital disorders of lymphatic vessels. LMs often have a somatic mutation in the PI3K pathway leading to increased activation of AKT which is believed to be the primary driver of abnormal lymphangiogenesis. An inhibitor of the PI3K pathway, sirolimus (SRL), has demonstrated exciting results clinically; however, not all LMs respond and many relapse after treatment is stopped. SHP2 is a positive activator of RAS/ERK pathway that overlaps with the PI3K/AKT pathway in cell growth and lymphangiogenesis. Both pathways are important for normal lymphatic development. Inhibiting both the PI3K/AKT and RAS/ERK pathways may lead to a more effective strategy for treatment of LMs.

**Methods:** Lymphatic endothelial cells (LEC) isolated from a patient with LM (LMLEC) were treated with SRL alone and in combination with SHP2 inhibitors to determine the impact on cell growth and lymphangiogenesis.

**Results:** LMLECs showed baseline hyperactivation of AKT and ERK compared to normal LEC. SRL treatment alone increased activated AKT in LMLECs over time. Combination treatment of SRL and SHP2 inhibitors synergistically reduced LMLEC survival, demonstrated a greater reduction in AKT and ERK activation and had a greater inhibition of lymphangiogenesis than either treatment alone.

**Conclusion:** Our results suggests additional cell growth pathways may allow LMs to escape from the current clinical treatment. Targeting parallel pathways may benefit LMs that do not respond to SRL treatment alone. We found that inhibiting SHP2 in combination SRL has a more potent effect on the PI3K/AKT and RAS/ERK growth pathways than either treatment alone.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Pediatric Thyroglossal Duct Cyst Excision: A NSQIP-P Analysis of Complications

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### Abstract

**Objective:** Identify and compare clinical risk factors, perioperative sequelae, and surgical complications of patients age 2 or younger to children above age 2 undergoing thyroglossal duct cyst (TGDC) excision.

**Methods:** Retrospective analysis of the American College of Surgeons National Surgical Quality Improvement-Pediatric Database (2014-2018). Study population includes pediatric patients ( $\leq 18$  years) who underwent excision of TGDC. Children aged 2 years or younger were compared to children older than 2 years.

**Results:** A total of 3052 cases were identified. There were 375 children with an age of 2 years or younger and 2977 who were older than 2 years. Mean age at time of surgery was 6.3 years, with a female-to-male ratio of 1:1.1. Following hospital discharge, there were 70 related readmissions and 3 related reoperations. There was no statistically significant gender ( $p=.270$ ) or ethnic ( $p=.122$ ) differences between groups. Additionally, a history of prematurity ( $p=.759$ ) and postoperative admission status (ie, inpatient versus outpatient,  $p=.697$ ) were not statistically significantly different between groups. Lastly, general complication rates between age groups including *Clostridium difficile* colitis, occurrences of bleeding and blood transfusion, surgical site infections, related readmission, and reoperation were not statistically significantly different.

**Conclusion:** TGDC excision was not shown to be associated with increased risk when performed in patients age 2 or younger compared to patients older than age 2.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Characteristics and Diagnostic Workup of Lingual Hamartomas

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### Abstract

#### Background

Lingual hamartomas are benign congenital malformations of the tongue composed of disorganized native tissue. Because these rare tumorlike structures are often found on the posterior dorsal surface, they are easily mistaken for lingual thyroid tissue. Current literature only describes case reports without clear recommendations for lesion workup.

#### Methods

A chart review from 1989 to 2020 at a tertiary children's hospital was conducted. Each chart was reviewed for demographics, physical exam, surgical pathology, and pre-operative imaging.

#### Results

10 patients (6 male, 4 female) with lingual hamartomas were identified. Average age at surgical excision was 15.6 months (SD 15.07, range 3 - 48). Follow-up ranged from 17 months to 15 years without evidence of recurrence. Surgical pathology diagnosed 8 leiomyomatous or smooth muscle hamartomas; records were lost for 2 children. Physical exam described 4 hamartomas as "pedunculated," and 2 as "widely based." 1 patient received CT neck, 2 received neck ultrasound, and 2 received MRI face. CT/ultrasounds confirmed presence of neck thyroid. MRI suggested no muscular invasion for one patient, whereas motion artifact obscured findings for the other.

#### Conclusion

Surgical excision remains definitive therapy for lingual hamartomas. By confirming the presence of neck thyroid and excluding the diagnosis of a lingual thyroid, neck ultrasound is a valuable first step in the workup of lingual hamartomas. CT provided the same pertinent information but involved radiation exposure. MRI provided minimal information and likely required sedation. Therefore, MRI was not ideal for diagnostic workup.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Characteristics of pediatric patients with basilar skull fractures who develop CSF leaks

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### Abstract

**Background:** Skull fractures are relatively common following head trauma in children, with 4-20% involving the skull base. CSF leak is a known complication of skull base fractures, and can occur in 10-30% of cases. The purpose of this work is to describe management and outcomes of patients who suffered basilar skull fractures who then subsequently developed CSF leaks. We also compare their characteristics against patients who suffered basilar skull fractures but did not develop CSF leaks.

**Methods:** Retrospective chart review between August 2009 and September 2018.

**Results:** We identified 521 pediatric patients who suffered basilar skull fractures, of whom 22 developed CSF leaks (4.2%). Mechanism of injury was from a fall (63.6%), motor vehicle accident (13.6%), or other. Of these patients, 50% presented with otorrhea and 13.6% presented with rhinorrhea. Most were managed conservatively, though three (13.6%) underwent neurosurgical interventions to resolve the leak. None developed meningitis. Of the 12 patients who obtained post-injury audiograms, 9 had documented hearing loss. There were no differences in GCS status, age, sex, race, ethnicity, or mechanism of injury. Interestingly, CSF leaks occurred more significantly for basilar skull fractures sustained away from home compared to those that occurred at home ( $p < 0.01$ )

**Conclusion:** 50% of CSF leaks presented with otorrhea and 13.6% presented with rhinorrhea. Rates of CSF leak do not correlate with patient demographic characteristics, GCS status, or mechanism of injury, though occur more frequently in injuries sustained away from home. CSF leaks can often be managed conservatively with low rates of meningitis.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Factors Influencing Patient Scheduling and Attendance of Pediatric Otolaryngology Referrals

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### Abstract

**Background:** Pediatric otolaryngologists receive a large number of pediatric referrals, many of which do not result in completed visits. Understanding the variables associated with visit scheduling and attendance may aid in efforts to increase visit completion and meet the care needs of patients.

**Methods:** We performed a secondary analysis of pediatric otolaryngology referrals from a large primary care network from November 1, 2016, to October 31, 2017. Referral outcome was categorized based on visit scheduling and completion within 90 days of referral. Referral diagnoses were categorized into nine groups by diagnosis code. Factors potentially associated with visit outcome were assessed using a multilevel mixed-effects logistic regression model.

**Results:** Among 4126 referrals, 58% resulted in an attended visit within 90 days. Median days to scheduled appointment ranged by referral diagnosis category from 16 days (for Trauma) to 64 days (for Adenotonsillar disease). In adjusted analysis, diagnoses categorized as “Adenotonsillar disease,” and “Inner ear disease” were associated with a lower odds of visit scheduling (OR 0.70, 95% CI 0.57-0.85; and OR 0.66, 95% CI 0.45-0.99, respectively) compared with “Middle and Outer Ear Disease.” Among scheduled visits, attendance was not associated with diagnosis category but did vary by duration to scheduled appointment ( $p < 0.001$ ).

**Conclusions:** Among pediatric patients seeking ENT consultation, likelihood of scheduling an appointment varied significantly by diagnosis. Diagnoses less frequently scheduled (e.g., sleep apnea, hearing concerns) may be opportunities to meet patient care needs through alternative strategies (e.g., econsults, referral guidelines, PCP education).

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Surgery for otitis media with effusion: a survey of otolaryngologists that treat children in Brazil

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### Abstract

**INTRODUCTION:** Otitis media with effusion (OME) is extremely common in children. Myringotomy and ear tube placement (MTP) is the surgical treatment for OME, and is the most common ENT surgery performed in children. Several guidelines have been developed to assist with the care of patients with OME who become candidates for MTP.

**OBJECTIVES:** The objective of this study was to evaluate how Brazilian otolaryngologists, who care for children, treat patients who require MTP for OME.

**METHODS:** A 30-question survey was sent to the members of the Brazilian Academy of Pediatric Otorhinolaryngology and/or members of the Otorhinolaryngology Department of the Brazilian Society of Pediatrics. Respondents were divided according to the time of clinical experience, location of their practice and percentage of children seen in their practices.

**RESULTS:** 208 otolaryngologists were surveyed, with 124 responses (59.6%). Of those, 59.7% use antiseptic before MTV surgery. Less than half (43.5%) always place a tube during the procedure. More physicians who practice in small cities recommend water precautions after MTP when compared to other physicians ( $p < 0.001$ ). Respondents that only care for children tend to not restrict swimming after MTP when compared to other physicians ( $p = 0.014$ ). Physicians in practice for more than 20 years prescribe more swim molds after MTP than younger physicians.

### CONCLUSION:

The respondents care for patients with otitis media with effusion who need ear tube placement in diverse ways. Their recommendations differ depending on how long they have been practicing, the percentage of pediatrics patients in their practice and where they are located.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Characteristics and Outcomes of Infants With Obstructive Sleep Apnea

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### Abstract

#### Background:

Obstructive sleep apnea (OSA) is known to have negative effects on health, behavior, and development in pediatric patients with studies showing benefit of adenotonsillectomy in these patients. However, the clinical picture of OSA in infants has been inadequately studied.

#### Methods:

This was a retrospective study involving infants 0-12 months of age with a diagnosis of OSA based on polysomnography (obstructive apnea hypopnea index > 1) between 2012 and 2019. Patients were included if there was follow up until 2 years of age or until resolution of OSA.

#### Results:

83 patients were included. Multiple diagnostic modalities were used for assessment and abnormalities were noted in 46/65 (70.8%) patients who underwent flexible fiberoptic laryngoscopy, 27/42 (64.3%) patients who underwent direct laryngoscopy and bronchoscopy, 25/36 (69.4%) patients who underwent modified barium swallow study, 17/19 (89.5%) patients who underwent drug induced sleep endoscopy, and 29/40 (72.5%) patients who underwent MRI. Comorbidities were common including GERD (53.0%), feeding difficulty (57.8%), neurologic problems (56.6%), hypotonia syndromes (37.3%), craniofacial syndromes (41.0%), laryngomalacia (21.7%), and micrognathia (22.9%). 61.4% were hospitalized during the follow up period for airway or respiratory related problems. 36.1% patients underwent surgery, including mandibular distraction (12.0%), supraglottoplasty (12.0%), tracheotomy (7.2%), tongue-lip adhesion (1.2%), and adenotonsillectomy (4.8%). 44.6% received oxygen therapy. 73.5% of patients achieved resolution of their OSA.

#### Conclusions:

OSA in infants represents a diverse group of clinical pathologies. Additional studies are warranted to determine the clinical consequences of sleep apnea in this unique population to help guide management.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

The association between vitamin D level and PFAPA syndrome: a systematic review

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### Abstract

Periodic Fever, Aphthous Ulcers, Pharyngitis and Adenopathy (PFAPA) Syndrome's etiology is not well understood. The objective of this study is to explore the association between vitamin D level and PFAPA syndrome.

### Methods:

A systematic review of all publications addressing the association between vitamin D level and PFAPA syndrome prior to May 2019 was conducted. Data were collected from online medical databases namely, PubMed, Ovid Medline, Embase, Cochrane Library, Google Scholar, and Scopus. The review adhered to the PRISMA statement and was performed in 3 main phases; an initial screening review of abstracts was performed, followed by a detailed review of full articles based on inclusion and exclusion criteria, and lastly a final review to extract data from selected articles.

### Results:

3 prospective review-based and one case report articles were included with a total of 281 patients, 98 of whom were cases of PFAPA, while 183 were controls. Vitamin D levels were deficient in 27% of PFAPA group as compared with the 9.25% of the control group. Vitamin D supplementation was given as an initial treatment in 25/98 of the patients. Only 1 patient received it as a second treatment. After vitamin D supplementation, a marked reduction of the number of febrile episodes and modification of the mean duration were recognized.

### Conclusion:

There is an association between Vitamin D deficiency and a higher frequency of PFAPA episodes. Vitamin D supplementation in children with PFAPA may reduce the frequency of episodes and help manage the condition.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Abstract Session 5 December 5<sup>th</sup> 1:45pm CST

#### Title of Paper

Anesthetic-related adverse events in infants under 6 months of age after ambulatory ENT surgery

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#### Abstract

**Background:** Current AAP guidelines recommend patients <6 months of age be monitored for >2 hours following general anesthesia. This discharge criteria has not been thoroughly evaluated and adhering to the guideline impacts throughput and potentially decreases caregiver satisfaction with unclear safety benefits. The aim of this retrospective study was to compare time to discharge based on clinical criteria to the AAP guideline and determine risks of adverse events associated with ENT surgery in neonates.

**Methods:** We queried the hospital's EMR to identify patients <6 months of age who underwent an ENT procedure between January 2015 to March 2020. Records were reviewed to gather data on patient characteristics, time intervals, and adverse events.

**Results:** 107 patients met inclusion criteria, of which 80 were ear tube insertions. Average time from out of OR to discharge was 57.8 min (range: 8, 238). 3 patients had an adverse event (2.8%): 2 laryngospasms without harm and 1 unplanned hospital admission for oxygen. 4 patients returned to ED/UC within 7 days, 1 for ongoing ear pain and 3 others unrelated to the surgery; none of these return visits were anesthesia related complications.

**Discussion/Conclusions:** There was a low incidence of adverse events in neonates having ambulatory ENT surgery using criteria-based discharge. AAP guidelines would not have prevented ED returns. This suggests that adherence to a 2-hour time-based criteria may pose an unnecessary delay to discharge ENT patients.

1. Polaner, D. M., & Houck, C. S. (2015). Critical Elements for the Pediatric Perioperative Anesthesia Environment. *Pediatrics*, 136(6), 1200-1205. doi:10.1542/peds.2015-3595

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Effects of Parental Presence during Induction of Anesthesia on Operative and Perioperative times in Pediatric Patients Undergoing Adenotonsillectomy

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### Abstract

**Background:** Adenotonsillectomy (AT) is a common pediatric surgery performed under general anesthesia with anesthetic gases to reduce anxiety. Other anxiolytic measures include Midazolam and parental presence during induction of anesthesia (PPIA) but there is little data on how these interventions affect operative times. The objective of this study was to compare operative and perioperative times among patients undergoing AT who received PPIA, Midazolam, both, or neither.

**Methods:** A retrospective review of patients under the age of twelve years who underwent AT during 2018 was performed. Patients with concomitant procedures, American Society of Anesthesiologists score greater than 3, or unclear PPIA participation were excluded. Patients were categorized into four groups: PPIA, Midazolam, both, or neither. Time spent in holding, the operating room (OR), and recovery were recorded. For comparison of continuous variables, One-Way ANOVA or Kruskal-Wallis tests were used with post-hoc comparisons using a Dunn's Test.

**Results:** A total of 69 patients received PPIA alone, 18 received Midazolam alone, 57 received both, and 8 received neither. Mean age was 5.34 years (range 0.62-11.97). The only significant difference found was between the OR time of the Midazolam only group and the group who received both PPIA and Midazolam ( $p < 0.05$ ), with patients receiving both having a shorter OR duration. No difference was found in holding or recovery time between groups.

**Conclusion:** This study supports that PPIA can be implemented when deemed appropriate without increasing operative or perioperative times and may even have a beneficial effect when compounded with Midazolam.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Disparities in Triage Call Line Utilization following Pediatric Tonsillectomies

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### Abstract

#### Objective:

Research seeks to illuminate disparities in pediatric surgery outcomes. Tonsillectomies are common surgeries performed in children with >8% of children readmitted for perioperative problems. A study performed at a tertiary center was done to evaluate if disparities exist in utilization of 24-hour phone lines set up to counsel and triage perioperative problems to reduce readmissions based on demographic, insurance or educational factors.

#### Methods:

Single institution case series study identifying children readmitted 7/2014-3/2020 following tonsillectomy using a Qlikview dashboard. Associations between number of calls, patient gender, race, ethnicity, age, zip code, insurance status, and presence of comorbidities were analyzed to determine if differences in utilization exist.

#### Results:

902 children (mean age 7.35 years) were readmitted on average 4.72 days after tonsillectomy (55 % bleeding, 27 % dehydration, 14 % pain). Patients of color compared with Caucasian race

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Efficacy and Safety of Paranasal Sinus Balloon Catheter Dilatation in Pediatric Chronic Rhinosinusitis: A Systematic Review

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### Abstract

**Background:** Chronic rhinosinusitis (CRS) negatively affects quality of life (QoL), and balloon catheter sinuplasty (BCS) has shown good outcomes in adult patients. Synthesized evidence for long-term efficacy and safety of BCS in pediatric populations is lacking. In the current study, we aimed to systematically review the current literature for studies demonstrating the effectiveness and side effects of BCS in pediatric CRS patients.

**Methods:** We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis recommendations (PRISMA) to conduct our study. We searched through PubMed, Embase and Cochrane Library to retrieve potentially relevant studies. Observational- and interventional-based studies reporting efficacy and/or side effects of BCS among pediatric populations were included. Efficacy was evaluated by reliable measures including Sino-Nasal 5 (SN-5) QoL survey, antibiotic need and rate of revision surgery.

**Results:** Out of 112 articles identified, 10 articles were included: two interventional controlled trials and eight observational studies. All studies evaluating QoL by SN-5 showed a significant reduction in SN-5 score postoperatively. The majority of BCS patients did not receive any course of sinusitis-indicated antibiotics during long-term follow-ups, and the majority have low surgical revision rates. Furthermore, improvement in the computed tomography (CT) and endoscopic findings for up to 1 year after operation was noticed. Minor side effects were reported, most commonly synechia.

**Conclusion:** BCS is safe and appears to be effective for the treatment of CRS in pediatric patients. Future randomized controlled studies with large sample sizes are warranted. Such studies can further determine the efficacy of BCS in managing children with CRS.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Management of Children with Allergic Fungal Rhinosinusitis; does age make a difference?

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### Abstract

#### Background:

Allergic fungal rhinosinusitis (AFRS) is a hypersensitivity response to the presence of fungi within the sinus cavity. Children represents a challenging group of patients when it comes to sino-nasal disorders as many are confused with adenoid hypertrophy. The objective of this study is to determine the various clinical manifestations and the management outcome of children with AFRS.

#### Methods:

Retrospective-chart-review of all children who underwent sinus surgery for AFRS at a tertiary healthcare center between 2005-2019. Demographics, clinical manifestation, radiological and laboratory results, treatment regimens, complications and recurrence rate were collected. Sub-analysis was performed based on age at first surgery; Group A (<13) and group B (≥13).

#### Results:

32 children underwent sinus surgery for AFRS during the study period. The mean age of surgery was 13.88 years. Bilaterality was present in 15/32 (47%) and anosmia in 9/32 (28%). Polyps on examination was present in 28/32 (87.5%) and proptosis in 8/32 (30.8%). Sub-analysis revealed that Group A had less bilateral disease (34.4%) compared to group B (65.6%) and a lower Lung-Mackay Score (median = 13 and 19 respectively, p value = 0.006). Postoperative CSF leak happened in one case (3.1%) and the overall recurrence rate was 25%. This was similar between both age groups (27.3% and 23.8% respectively).

#### Conclusion:

The age of surgery did not have an impact on the outcome. A high index of suspicion should be exercised when dealing with children with sinonasal symptoms that do not respond to rhinitis/adenoiditis treatment and should be investigated for chronic sinusitis.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

The Need for a Primary Adenoidectomy at the Second Tympanostomy Tube Placement for Children Under the Age of Three

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### Abstract

#### Background

The relationship between a primary adenoidectomy at the time of a second tympanostomy tube (TT) placement and the need for a third TT placement in children is not well established. The goal with this study is to provide additional evidence-based information to aid medical decision making.

#### Methods

This retrospective cohort study utilized data from institutional electronic health records between 2015 and 2019. The population studied was children under the age of three with a history of two separate bilateral TT placements for chronic otitis media. The intervention was a primary adenoidectomy performed during the second TT placement. This was compared to cases where the child did not receive an adenoidectomy at the second TT placement. The main outcome was the need for TT placements within 12 months of the second procedure.

#### Results

The children studied received the second TT placement at an average age of 2.16 years old. Of those children, the rate that required a third placement of TT who had a primary adjuvant adenoidectomy at the time of the second TT placement was 13.3% (95% CI 0.054- 0.332). In comparison, the rate of children requiring a third TT placement who did not receive a primary adjuvant adenoidectomy at the time of second TT placement was 21.1% (95% CI 0.088-0.503). The relative risk was 0.633.

#### Conclusion

A primary adenoidectomy at the time of the second TT placement in a child younger than three is not likely to significantly reduce the need for a third TT placement by itself.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Meta-analysis of airway reconstruction failures

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### Abstract

**Introduction:** Management of pediatric airway stenosis requires careful planning to prevent surgical failures. Unfortunately, they still occur and can lead to both further delays in care and subsequent airway interventions. Variable data exist regarding these instances and the factors that lead to the need for revision surgery, almost exclusively single-institutional studies. We sought to perform a metaanalysis of current literature describing surgical failures of pediatric airway reconstruction.

**Methods:** A database search with key terms was performed between 1993-2020. Among inclusion criteria were descriptive analyses of surgical failure patients and/or revision surgery.

**Results:** In total, 44 abstracts were screened with 11 meeting inclusion criteria. Of 762 included patients, 83 underwent revision laryngotracheal reconstruction (LTR) and 17 underwent revision cricotracheal resection (CTR). A majority of studies indicated high grade stenosis (Cotton-Myer grade 3/4) as the primary etiology increasing failure risk. Syndromic diagnoses, reflux, and comorbidities were less readily identified as reasons for failure. Two studies found age to be the sole significant variable, independent of stenosis or comorbidities. There were no differences between factors identified for failure of LTR versus CTR.

**Conclusion:** Complex pediatric airway reconstruction has an overall high success rate, lending significant weight to identification of factors which may increase risk of failure. High grade stenosis has been shown to consistently increase the risk of primary surgical failure, while age at surgery showed varying effects on success rate. Identification and discussion of these factors preoperatively can provide families with evidence-based expectations for surgery.

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## Combined 2020 Virtual Meeting Abstract Session Information

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Measuring the Quality of Life Impact of a New Pediatric Tracheostomy on Caregivers

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### Abstract

#### Objectives:

To quantify the quality-of-life impact of initial tracheostomy placement on caregivers.

**Methods:** We surveyed the caregivers of children undergoing initial tracheostomy placement utilizing the PedsQL Family Impact Module. This instrument is validated to measure a child's health on a family's cognitive, emotional, physical, and social functions (best score = 100, worst = 0, average = 80). The scores were compared to a healthy community sample and caregivers with established tracheostomy dependent children.

**Results:** Caregivers with a new tracheostomy (N=21) had a mean PedsQL total score of 69.2 with a standard deviation of 3.8 compared to the community average of 80.9 (SD=16.7). This difference was significant (95% CI = -18 to -4.4, two-tailed student's t test,  $t=-3.2$ ;  $P = .002$ ). These families also had lower average score for physical functioning (62.9 vs. 81.4,  $P < .001$ ), emotional functioning (65.0 vs. 78.0,  $P = .004$ ), and social functioning (73.2 vs. 85.4,  $P = .004$ ). In contrast, the PedsQL total score was similar to established tracheostomy families (69.2 vs. 73.8,  $P = .31$ ). But significant differences were noted in two sub-scale-items - "I feel sad," (59.5 vs. 75.6,  $P = .009$ ), and "I worry about the side effects of treatments," (45.2 vs. 65.3,  $P = .009$ ).

**Conclusions:** Tracheostomy has a significant effect on a caregiver's quality-of-life when compared to community samples with healthier children but is similar to families with long-standing tracheostomies. These findings imply the presence of tracheostomies permanently depresses many quality-of-life domains.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

FEES in a Secretion Management Program: A Partnership with PM&R

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### Abstract

#### Background

As many as 10-37% of children and adults with developmental delays, including cerebral palsy, present with moderate to severe sialorrhea. Sialorrhea can produce negative effects on physical health and quality of life, especially in patients with chronic neurological disabilities (Meningaud et al, 2006). This is often an overlooked point of care for patients and few facilities have a multidisciplinary team to evaluate and treat sialorrhea in the pediatric population.

#### Methods

The Saliva Management Program at our tertiary pediatric hospital includes a team of Physical Medicine and Rehabilitation physicians, Otolaryngologists, and Speech-Language Pathologists. The team provides medical and therapeutic assessment, as well as develops a treatment plan together, that may include feeding therapy and/or medical interventions. Flexible Endoscopic Evaluation of Swallowing (FEES) is the primary instrumental swallowing exam utilized for this patient population. Families complete a Drooling Impact Scale throughout their therapy course to track outcomes and satisfaction. The Secretion Severity Rating Scale (SSRS, Murray et al 1996) is utilized to describe pharyngeal secretions during their FEES exam.

#### Results

The SSRS defines posterior secretions by a rating scale of 0-3. Review of evidence has shown that patients with score of 2-3 are much more likely to demonstrate aspiration and acquire pneumonia. The average SSRS of patient's reviewed (n=7) was a 2. The Drooling Impact Scale has shown improvement (n=15) by an average of 17 points.

#### Conclusion

FEES is a highly useful tool in a secretion management program. Children with difficulty managing their secretions require specialized, multidisciplinary care.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Coblator use for laryngeal cleft repair

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### Abstract

**Introduction:** Laryngeal cleft repair is traditionally performed with cold-steel instrumentation. Advances in technology have allowed utilization of the CO2 laser, yet the setup can be timely and pose a hazard of airway fire. The coblation wand has routinely been used for adenotonsillectomy, yet not in other aspects of airway surgery. It provides the benefit of hemostatic control without added risk for airway fire. We present our initial findings of patients undergoing laryngeal cleft repair using the coblation wand.

**Methods:** Retrospective review of all laryngeal cleft repair cases from 9/1/2017 to 9/1/2020. Preoperative and postoperative swallow studies were reviewed.

**Results:** 17 patients (13 months-5 years), all with type 1 laryngeal cleft, were identified. 7 patients underwent repair using cold-steel, 3 underwent repair with CO2 laser, and 7 patients had repair using coblation wand. 5 patients were lost to follow up. Postoperative feeding assessment revealed improvement in all patients, each with at least improvement in 2 to 3 levels of consistency.

**Conclusion:** Utilization of the coblation wand for laryngeal cleft repair should be considered. Our initial findings reveal similar, if not better, outcomes compared to other techniques. Further research with a larger cohort to identify post-operative feeding results, length & cost of procedure, and long-term outcomes, will help standardize the technique.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Risk Factors for Intensive Care Unit Intervention After Pediatric Supraglottoplasty

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### Abstract

#### Background

Laryngomalacia is the most common cause of stridor in infants leading to respiratory and feeding difficulties. Prior research has focused on the techniques and outcomes of supraglottoplasty, however there are limited data to guide evidence-based postoperative care plans. Our objective is to determine perioperative characteristics that predict need for PICU-level care.

#### Methods

We conducted a retrospective chart review of all children diagnosed with laryngomalacia who underwent supraglottoplasty at Children's Hospital Los Angeles. A PICU-level event was defined as any of the following requirements within 24 hours of surgery: 1) reintubation, 2) positive pressure ventilation, 3) more than one dose of racemic epinephrine, or 4) greater than 4 liters of oxygen via nasal cannula.

#### Results

A total of 41 subjects were enrolled, median age of 2.4 months (range 2 weeks to 7 years) and the majority (80%) with a documented race were Hispanic. Twenty-one (51%) subjects had at least one documented PICU-level event. After adjusting for age and gender, children with a pre-existing gastrostomy tube had 7.06 times greater odds of having a PICU-level event as those without a gastrostomy tube ( $p=0.04$ , 95%CI: 1.05, 47.4). Children that were admitted preoperatively had 11 times the odds of having a PICU-level event than those who were not admitted preoperatively ( $p=0.007$ , 95%CI: 1.9, 63.2).

#### Conclusion

Children admitted preoperatively or with a pre-existing gastrostomy tube had greater odds of having a PICU-level event after supraglottoplasty. The results of this study can help inform decisions regarding the appropriate level of postoperative care required after supraglottoplasty.

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## Combined 2020 Virtual Meeting Abstract Session Information

### Title of Paper

Combined Laryngeal Cleft and Salivary Botulinum Toxin Injections in Neurologically Impaired Children: Where to next?

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### Abstract

**Background:** Children with neurological disorders can have sialorrhea and aspiration of secretions. Laryngeal clefts may also be present. Laryngeal cleft (LC) and Salivary Botulinum toxin (Sal-Bot) injections are considered transient therapies for laryngeal clefts and sialorrhea respectively. We sought to highlight indications, responses to treatment and next steps for combined LC and Sal-Bot injections.

**Methods:** A case series with retrospective review for patients undergoing combined LC injections and Sal-Bot injections from 2012 - 2019 at a tertiary care pediatric hospital was performed. Presenting symptoms, number of respiratory infections, responses to treatments and follow up interventions were noted.

**Results:** 8 patients averaging 4.18 years (1.1 years - 10.89 years) had combined LC and Sal-Bot Injections. All patients had type 1 laryngeal clefts. All patients had underlying neurologic conditions (hypoxic encephalopathy, seizures and/or cerebral palsy), dysphagia, sialorrhea and choking on secretions. 5 out of 8 patients presented with > 1 episode of aspiration pneumonia/yr, 4 of which had a decrease in episodes after injections. 2 patients had no change symptoms, 3 had improvement in choking on secretions only, while 4 had improved on choking and sialorrhea. Based on responses and their timelines, 2 patients had no further treatment, 2 had further LC repairs only, 1 sialorrhea treatment only, and 4 further combined sialorrhea and LC procedures.

**Conclusion:** Combined LC and Sal-Bot injections can be done in patients with sialorrhea, and a laryngeal cleft. It can guide next steps for therapeutic interventions. Practitioners can use timelines of response to guide next step in therapy.

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