124TH ANNUAL MEETING AT COSM
April 29-30, 2022 • Hyatt Regency • Dallas, Texas

Triological Society's Mission Statement and Goals
The American Laryngological, Rhinological and Otological Society, Inc., aka The Triological Society, was founded in 1895 in New York, New York. In the more than 120 years since its founding, the Triological Society has attracted the best and brightest in academic and clinical otolaryngology. Membership in the Triological Society brings the distinction of being elected to the most prestigious society in otolaryngology. Active Fellowship is achieved by presenting a thesis in the field of otolaryngology considered acceptable to a panel of peers. For those entering the field of otolaryngology, the Society provides role models. For those who are committed to research and related scholarly activity, the Society offers fellowship with like-minded peers who share common values, interests, and concerns.

The Society disseminates scientific information by presenting the latest basic science and clinical information at scientific meetings and through publication of its scientific journals, ***The Laryngoscope*** and ***Laryngoscope Investigative Otolaryngology***. The Society promotes research into the causes of and treatments for otolaryngic diseases by attracting promising physicians to scholarly otolaryngology research and supporting their development, providing financial support for the research efforts of young scientists, and promoting the highest standards in the field of otolaryngology-head and neck surgery.

Mission
The mission of the Triological Society is to encourage and assist otolaryngologist-head and neck surgeons and other health care professionals to develop, maintain, and enhance their knowledge and skills in their pursuit of improved patient care through education, research, and fellowship.

Goals
- To continue the noble legacy of the Triological Society, which is to attract, develop and mentor the best otolaryngologists to become scholars and leaders.
- To encourage, support, and disseminate through meetings, print and electronic mediums the latest basic and clinical research findings and reports on evidence-based medicine pertaining to the diagnosis, treatment and prevention of the full spectrum of disorders of the head and neck and related structures.
- To seek out and encourage scientific and technical advances in otolaryngology-head and neck surgery.
- To provide a forum through meetings, print and electronic mediums for the international exchange of ideas and knowledge in otolaryngology-head and neck surgery and related fields of medicine and science.
- To provide for physician professional development through support of teaching and peer reviewed research.
- To encourage the highest ethical and professional standards in the delivery of patient care by otolaryngologist-head and neck surgeons.
- To promote academic excellence by requiring peer recommendations and an acceptable mentored thesis for admission to membership.
- To ensure that all educational activities comply with ACCME directives, and develop vehicles for otolaryngologist-head and neck surgeons to meet their Maintenance of Certification requirements.
- To enhance fellowship amongst members by creating social forums for interface and conversation.
- To maintain *The Laryngoscope* and *Laryngoscope Investigative Otolaryngology* as primary journals at the forefront of excellence as a resource and venue for scientific advancement of the profession.
- To advance the Society's standing outside the field of otolaryngology-head and neck surgery and promote across all types of practice environments.

To facilitate the above goals, the Society sponsors educational meetings. The Society's journals, ***The Laryngoscope*** and ***Laryngoscope Investigative Otolaryngology*** serve as a means of disseminating the latest basic and clinical research results. The Society encourages research in otolaryngology-head and neck surgery by providing research grants and awards on a competitive basis.

In 2021, the Triological Society awarded:
- $480,000 in grant funds to otolaryngologist-head and neck surgeons to 1) help facilitate research career development in young otolaryngologists; and 2) further support otolaryngology clinical scientists with new or existing K08/K23 awards;
- $6,300 to residents, medical students, and Fellows who presented award winning posters at the Society's meetings.

Learning Objectives for This Activity
This activity is designed for otolaryngologists-head and neck surgeons and other health professionals. Upon completion of this course, participants will be able to:

- Discuss the benefits of patient stratification in the management of HPV positive SCCa of the head and neck.
- Implement multidisciplinary care in patients undergoing Gender Affirmation treatment.
- Manage patients intelligently by following established Best Practice Recommendations.
- Assess patients properly to determine who would benefit from a multidisciplinary approach to care.

Exhibits
Exhibitors will include representatives of pharmaceutical companies, instrument companies, diagnostic equipment companies, publishers, and others. We encourage attendees to visit the exhibit hall for information that may assist in their pursuit of improved patient care. Exhibitor arrangements are in compliance with the Accreditation Council for Continuing Medical Education (ACCME) Standards for Commercial Support.

Information presented by exhibitors and oral and poster presenters does not represent an endorsement by the Triological Society.

Disclosure Information
In accordance with the ACCME Accreditation Criteria, the American College of Surgeons must ensure that anyone in a position to control the content of the educational activity (planners and speakers/authors/discussants/moderators) has disclosed all financial relationships with any commercial interest (termed by the ACCME as “ineligible companies”, defined below) held in the last 24 months (see below for definitions). Please note that first authors were required to collect and submit disclosure information on behalf all other authors/contributors, if applicable. Please see the insert to this program for the complete disclosure list.

Program Evaluation and CME Certificates
Participant comments on program evaluation forms assist Program Advisory Committees in determining the direction of future educational activities. We appreciate your input and request that you complete a program evaluation in exchange for a CME certificate of attendance. Records are maintained in the Administrative Office of the Society and maintained by the American College of Surgeons for Fellows of the College. Requests may be made by sending a self-addressed envelope to: Triological Society ● 13930 Gold Circle, Suite 103 ● Omaha, NE 68144 ● 402-346-5500.

The below QR code is provided as a link to our program evaluation.

CONTINUING MEDICAL EDUCATION CREDIT INFORMATION

Accreditation

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of American College of Surgeons and Triological Society. The American College of Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

AMA PRA Category 1 Credits™

The American College of Surgeons designates this live activity for a maximum of **10** *AMA PRA Category 1 Credits™.* Physicians should claim only the credit commensurate with the extent of their participation in the activity.

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ACCME
ACCREDITED WITH COMMENDATION

AMERICAN COLLEGE OF SURGEONS
DIVISION OF EDUCATION

MESSAGE FROM THE PRESIDENT, MICHAEL S. BENNINGER, MD FACS

I am most pleased to welcome you all to the 124th Annual Meeting of the Triological Society in Dallas as part of the Combined Otolaryngology Spring Meetings. I look forward to reconnecting with our many active Fellows and meeting our new inductees. The Triological Society program is unique amongst our COSM fellow organizations spanning the breadth of the specialties within otolaryngology. I am excited to share our program and our collegiality to those that have attended many of our meetings in the past and to those that may be new to our meetings. This is a very broad and exciting program, and I would like to thank Romaine Johnson, Program Chair, and the Program Committee, supported by Myles Pensak and our fantastic Triological Staff, for their hard work and diligence in providing this outstanding program. I hope that you will join me for our Ogura lecturer, Dr. Lara Jehi, as she helps to describe how Quantum Computing and Artificial Intelligence will continue to weave themselves into the future of healthcare. There will be so much to see and learn, and now that we are back meeting in person, I would like to encourage each of you to continue your experiences between the sessions and in your social interactions. This year will also be a changing of the guard for our organization. We will be recognizing Gail Binderup and Marsha Holbert, who will be retiring after numerous years of effort on our behalf. The Triological offices will be moving from Omaha to Chicago and we welcome our new Administrator, Beth Faubel, as she joins Beth Slovinski and Colleen Finnerman in seamlessly moving us forward. I would like to personally thank the Society and all of you for the trust and support you have shown to me as President. This year has been the highlight of my academic career. I so look forward to meeting as many of you as I can as we celebrate this wonderful educational program, our heritage, our friendships, and our Noble Legacy.

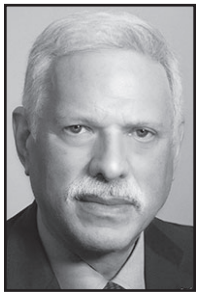
TRIOLOGICAL SOCIETY HONOREES

JOSEPH H. OGURA, MD LECTURER
Lara Jehi, MD MHCDS

Dr. Jehi is professor of neurology at Cleveland Clinic Lerner College of Medicine, and Chief Research Information Officer for the Cleveland Clinic Health System. In this role, she works closely with information technology, research, finance and other departments to organize and optimize the Cleveland Clinic's digital infrastructure and computational research strategy to better support research activities and accelerate new treatments for patients. She is currently spearheading multi-institutional National Institutes of Health-funded grants focused on data science, and individualized outcome prediction. She is the principal investigator of Cleveland Clinic's Bio-repository, and the Executive Program Lead for the Discovery Accelerator, a strategic partnership between Cleveland Clinic and IBM to accelerate research and innovation leveraging high performance computing, artificial intelligence and Quantum computing. She is the vice-chair of Cleveland Clinic's Institutional Review Board.

She chairs several key commissions in national and international professional societies, has more than 170 peer-reviewed publications, 10 book chapters and is a regular reviewer for NIH study sections. In addition to her medical training in epilepsy, she holds a Master's degree in Health Care Delivery Science from Dartmouth College.

GUEST OF HONOR
Robert T. Sataloff, MD DMA FACS



Robert T. Sataloff, MD, DMA, FACS is Professor and Chairman, Department of Otolaryngology-Head and Neck Surgery and Senior Associate Dean for Clinical Academic Specialties, Drexel University College of Medicine. Dr. Sataloff is Director of Otolaryngology and Communication Sciences Research at the Lankenau Institute for Medical Research, and Director of Otolaryngology Education at Lankenau Medical Center. He also holds Adjunct Professorships in the Departments of Otolaryngology-Head and Neck Surgery at Thomas Jefferson University, Temple University and the Philadelphia College of Osteopathic Medicine; and he is on the faculty of the Academy of Vocal Arts. He serves as Conductor of the Thomas Jefferson University Choir. Dr. Sataloff is also a professional singer and singing teacher. He holds an undergraduate degree from Haverford College in Music Theory and Composition; graduated from Jefferson Medical College, Thomas Jefferson University; received a Doctor of Musical Arts in Voice Performance from Combs College of Music; and he completed Residency in Otolaryngology - Head and Neck Surgery and a Fellowship in Otology, Neurotology and Skull Base Surgery at the University of Michigan. Dr. Sataloff is Chairman of the Boards of Directors of the Voice Foundation and of the American Institute for Voice and Ear Research. He also has served as Chairman of the Board of Governors of Graduate Hospital; President of the American Laryngological Association, the International Association of Phonosurgery, the Pennsylvania Academy of Otolaryngology-Head and Neck Surgery, and The American Society of Geriatric Otolaryngology, and in numerous other leadership positions. Dr. Sataloff is Editor-in-Chief of the Journal of Voice; Editor Emeritus of Ear, Nose and Throat Journal; Associate Editor of the Journal of Singing; on the Editorial Board of Medical Problems of Performing Artists, and is an editorial reviewer for numerous otolaryngology journals. He has written over 1,000 publications including 70 books, and he has been awarded more than $5 million in research funding. His H-index is 43 (as of January 2022). He has invented more than 75 laryngeal microsurgical instruments distributed currently by Integra Medical, ossicular replacement prostheses produced by Grace Medical, and a novel laryngeal prosthesis (patent pending). He holds a patent on a unique thyroplasty implant. His medical practice is limited to care of the professional voice and to otology/neurotology/skull base surgery. Dr. Sataloff has developed numerous novel surgical procedures including total temporal bone resection for formerly untreatable skull base malignancy, laryngeal microflap and mini-microflap procedures, vocal fold lipoinjection, vocal fold lipoimplantation, and others. Dr. Sataloff is recognized as one of the founders of the field of voice,

having written the first modern comprehensive article on care of singers, and the first chapter and book on care of the professional voice, as well as having influenced the evolution of the field through his own efforts and through the Voice Foundation for over 4 decades. Dr. Sataloff has been recognized by Best Doctors in America (Woodward White Athens) every year since 1992, Philadelphia Magazine since 1997, and Castle Connolly's "America's Top Doctors" since 2002.

PRESIDENTIAL CITATION AWARDEE
Jean Abitbol, MD

Jean Abitbol, MD, is an Otolaryngologist, Head Neck surgeon, a Phoniatrician and a Laser specialist. He performs surgery of the voice and treats voice professionals since 35 years. He did his medical study at the "Faculté de Médecine de Paris (France)". He was Co-Chairman of the Department of Otolaryngology Head Neck Surgery at Beaujon Hospital and Chairman of the Department of Otolaryngology Head Neck Surgery and Laser research Stell Hospital (Ile de France) from 1981 to 1997. He is in private practice in Paris since 1981.
He was knighted in May 2005 "Chevalier de la Legion d'Honneur" by the Ministry of Health on the behalf of the President de la République Française.

He was nominated on September 2007 Adjunct Professor, Department of Otolaryngology – Head and Neck Surgery, Drexel University College of Medicine of Philadelphia (USA). He is ex-President of the 20th International Society for Laser Surgery and Medicine and now on the Board of the Executive Council of the International Society for Laser Surgery and Medicine.

He is one of the founders of the European Laser Association. He is on the Board of Directors of the Voice Foundation. He is on the Board of the International Association of Phono-Surgery. He is a member of numerous international scientific societies. In 1983, in collaboration with the Ministry of Culture and Health of France, he created the Voice Centre in La Cité des Sciences et de l'Industrie – Paris.

In September 2005, he received the certificate of Honour Award at the Foundation of the American Academy of Otolaryngology- Head and Neck Surgery. He received the Presidential Citation of the American Laryngological Association in 2006, 2012, 2016.

His passion doing medical films on Art and Science of the Voice since1985 with "the vocal imprint" which received 5 awards. The last one in June 2013: the mystery of the voice. In February 2006, for his participation on "The Inner Adventure", a 90 minute movie with Arte TV channel, he received "le Grand Prix of the 43e Festival International Techfilm 2005" de Prague (République Tchèque)", and the "Silver World Medal at the New York USA Festivals 2006".

His books:

Scientific: In April 1995, he is the author of the 520 page book: Laser Voice Surgery, who compiles his experience over 5,000 cases in this book. He wrote more than 300 medical publications. He has contributed to many scientific books. His main contributions were on laser voice surgery, the female voice and endocrine disorders, and the CT-scan 3D of the larynx.

For lay people, he published 5 books:
"The Odyssey of the Voice" a tremendous journey through the human voice 2005
"The Power of the Voice" 2019
"The Female Voice" 2019
"The Beautiful Story of the Voice" a voyage from the chimpanzee to the Android 2020
"These Voices Who Govern Us" 2022

PRESIDENTIAL CITATION AWARDEE
Brian B. Burkey, MD FACS

Brian B. Burkey MD, MEd, FACS is currently Chairman of Otolaryngology-Head and Neck Surgery at Cleveland Clinic Indian River Hospital and Chairman of the Regional Institute for Surgical Specialties within the Cleveland Clinic Florida system. Dr. Burkey came to the Cleveland Clinic after almost twenty years at Vanderbilt University Medical Center, rising to Professor of Otolaryngology and Vice-chairman within that department.

Dr. Burkey finished undergraduate studies at the Johns Hopkins University, before obtaining his medical degree at the University Of Virginia School Of Medicine in 1986. He completed otolaryngology residency training at the University Of Michigan Department Of Otolaryngology and a fellowship in microvascular and facial plastic and reconstructive surgery at the Ohio State University, before launching his career at Vanderbilt. He has been an American Board of Otolaryngology diplomate since 1992, and his practice has an emphasis on head and neck oncologic and microvascular reconstructive surgery. He began co-directing the Vanderbilt fellowship in Head and Neck Oncologic and Microvascular Reconstructive Surgery starting in 1992, one of the early fellowships in microvascular surgery, and has trained over 40 fellows during his career, almost all of whom have positions in academic otolaryngology both nationally and internationally. He has continued this fellowship at the Cleveland Clinic (Ohio), which is accredited by the American Head and Neck Society.

At Vanderbilt, Dr. Burkey served as residency Program Director for 15 years, which spanned three successful site visits. Dr. Burkey completed a seven-year tenure on the Otolaryngology Residency Review Committee of the ACGME, serving two years as Vice-chairman and two years as Chairman of that body. He then served as a consultant with ACGME-International and helped three programs in Singapore gain initial accreditation. He was on the steering committee which founded the Otolaryngology Program Directors Organization (OPDO), and served on the Executive Council and as President of the Society of University Otolaryngologists (SUO). He has also served as a guest examiner and senior examiner of the American Board of Otolaryngology and has been a member of the

Board of Governors and numerous educational committees of the American College of Surgeons.

Dr. Burkey has been an active member of the American Head and Neck Society, serving on many committees, and as Secretary, and is now President-elect of that organization. He is a proud member of the Triological Society and has presented at multiple regional and national meetings and served on its committees. He serves on the editorial board of multiple journals in the field of otolaryngology, and has lectured extensively on educational and clinical subjects both nationally and internationally. He has authored over 20 book chapters and 120 peer-reviewed articles on head and neck and reconstructive surgery topics. He has been a leader on several cooperative group studies and been a co-principal investigator of NIH-funded research. He continues to mentor residents and fellows and is hoping to continue innovation within all areas of medical education. He completed his Masters degree in Education with an emphasis on the health professions in the summer of 2014. Dr. Burkey is married to Maureen, his wife of over 39 years, and their daughter Rachel Burkey lives and works in Weston, FL.

PRESIDENTIAL CITATION AWARDEE
Dennis H. Kraus, MD FACS

Dennis Kraus, MD is the Enterprise Executive Medical Director, Oncology at Centura Health. Centura Health is an ecosystem of seventeen hospitals across Colorado and Western Kansas.

He was Chair of the Lenox Hill Hospital Cancer Committee, Member of the Cancer Oversight Committee for the Northwell Health System, Professor of Otolaryngology at Donald and Barbara Zucker School of Medicine at Hofstra/ Northwell and a Member of the Admissions Committee for the Hofstra School of Medicine. He has served in a number of administrative positions within the otolaryngology and head and neck surgery communities. He has served in multiple roles within the AHNS, including program chair of the annual meeting, Secretary, and past President.

He is Past-Chair for the American College of Surgeons Otolaryngology Advisory Council. He serves on the American Joint Commission of Cancer. He is the past president of the North American Skull Base Society, the New York Head and Neck Society and the New York Laryngological Society. He is currently co-editor in chief of the Skull Base Journal and associate editor of Head and Neck Surgery. He is past chair of the Subspecialty Advisory Council for the American Academy of Otolaryngology-Head and Neck Surgery and the Head and Neck Educational committee and the Home Study Course.

His clinical interest focuses on all aspects of head and neck oncology and his research efforts have paralled his clinical initiatives. He has particular expertise as it relates to minimally invasive thyroid surgery, robotic surgery of the head and neck and sentinel node biopsy for cutaneous malignancies. He has been a strong advocate for the use of minimally invasive surgery in the sinonasal region and skull base. Each of these developments has been associated with decreased morbidity with improved cosmetic and functional outcomes for patients with head and neck neoplasms. Dr. Kraus lives in Denver, Colorado with his wife of 30 years Daryl and has 3 adult children, all of whom are successful in professional positions.

PRESIDENTIAL CITATION AWARDEE
Kathleen L. Yaremchuk, MD MSA

Kathleen Yaremchuk, MD MSA is the Chair of Otolaryngology/Head & Neck Surgery, Division of Audiology, Division of OMFS section of General Dentistry at Henry Ford Hospital in Detroit, Michigan. She has received the Jerome C. Goldstein Public Service Award from the American Academy of Otolaryngology/Head & Neck Surgery Foundation, served as the President of the Women in Otolaryngology and is the President Elect of the American Academy of Otolaryngology/Head & Neck Surgery.

Dr. Yaremchuk has served as Vice President of the Middle Section for the Triological Society. Dr. Yaremchuk is Board Certified in Sleep Medicine and Otolaryngology/Head & Neck Surgery and is Secretary/Treasurer for the International Surgical Sleep Society (ISSS). She is the Sleep Associate Editor for Laryngoscope.

Dr. Yaremchuk has published extensively and is known for her commitment to sleep medicine, gender equity and leadership for Otolaryngology/Head & Neck Surgery.

PROGRAM PLANNING AND ADVISORY COMMITTEE

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Dallas, TX

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Cleveland, OH

Erin D. Wright, MD
Edmonton, AB Canada

Katherine C. Yung, MD FACS
San Francisco, CA

2022 THESIS AWARD WINNERS

Harris P. Mosher Award

Theodore R. McRackan, MD MSCR, Medical University of South Carolina
Development and Implementation of the Cochlear Implant Quality of Life (CIQOL) Functional Staging System

Edmund Prince Fowler Award

Steven J. Eliades, MD PhD, Duke University
Effects of Cortical Stimulation on Feedback Dependent Vocal Control in Non-Human Primates

Maureen Hannley Alternative Science Award

Antoine Eskander, MD ScM FRCSC, Sunnybrook Health Sciences Centre
Surgeon Thyroidectomy Case Volume Impacts Disease Free Survival in the Management of Well Differentiated Thyroid Cancer

Honorable Mention for Basic Science Award

Trung N. Le, MD PhD, Sunnybrook Health Sciences Centre
Magnetic Targeting of Gadolinium Contrast to Enhance Magnetic Resonance Imaging of the Inner Ear in an Endolymphatic Hydrops Mouse Model

Honorable Mention for Clinical Research Award

Karla D. O'Dell, MD, University of Southern California
Serial In-office Steroid Injections for Airway Stenosis: Long Term Benefit and Cost Analysis

With Distinction Award

Joseph M. Curry, MD FACS, Thomas Jefferson University
CD8+ and FoxP3+ T Cell Intercellular Distances Differ in HPV+ and HPV- HNSCC and Predict Response to Anti PD-L1 Checkpoint Inhibition

With Distinction Award

Charles J. Limb, MD, University of California - San Francisco
The Impact of Vocal Boost Manipulations on Musical Sound for Cochlear Implant Users

NEW FELLOWS TO BE INDUCTED

New Fellow Ceremonies followed by the reception with Triological Fellows is scheduled on Friday, April 29th from 7:00 am to 7:50 am in Landmark B Ballroom

Boris L. Bentsianov, MD . . . . . Staten Island, NY
Sarah N. Bowe, MD FACS . . . . . San Antonio, TX
Jolie L. Chang, MD FACS . . . . . San Francisco, CA
Joseph M. Curry, MD FACS . . . . . Wynnewood, PA
John R. de Almeida, MD MSc . . . . . Toronto, ON Canada
Megan L. Durr, MD FACS . . . . . Oakland, CA
Steven J. Eliades, MD PhD . . . . . Durham, NC
Antoine Eskander, MD ScM FRCSC . . . . . Toronto, ON Canada
David A. Gudis, MD FACS . . . . . New York, NY
Jacques H. Herzog, MD . . . . . Chesterfield, MO
Barry E. Hirsch, MD . . . . . Pittsburgh, PA
Allen S. Ho, MD . . . . . Los Angeles, CA
Edward C. Kuan, MD MBA . . . . . Orange, CA
Amy Anne D. Lassig, MD FACS . . . . . Minneapolis, MN
Trung N. Le, MD PhD . . . . . Toronto, ON Canada
Charles J. Limb, MD . . . . . San Francisco, CA
Chadi Makary, MD . . . . . Morgantown, WV
Theodore R. McRackan, MD MSCR . . . . . Charleston, SC
Karla D. O'Dell, MD . . . . . Sherman Oaks, CA
Anais Rameau, MD MPhil . . . . . New York, NY
Eileen M. Raynor, MD FACS . . . . . Raleigh, NC
Soham Roy, MD FACS . . . . . Houston, TX
Maya G. Sardesai, MD MEd . . . . . Mercer Island, WA
James W. Schroeder, MD FACS . . . . . Chicago, IL
Yelizaveta Shnayder, MD FACS . . . . . Kansas City, KS
Kevin C. Welch, MD . . . . . Chicago, IL
Craig H. Zalvan, MD . . . . . Briarcliff Manor, NY

HARRIS P. MOSHER AWARD

Given in recognition of the excellence of the Candidate's Thesis in Clinical Research. This honor was created to perpetuate the ideals of the great teacher for whom it was named and to bestow upn a worthy recipient the responsibility of furthering the highest standards of perfection in the study, teaching and practice of Otolaryngology.

Harris P. Mosher • 1867-1954

Highly respected, feared, and revered by his students, Dr. Mosher attended Harvard College and the Harvard Medical School, receiving his MD degree in 1896. There were no formal residency training programs then, so he sought training at the best ear, nose and throat centers in Germany, namely, with Jansen in Berlin and Grunert in Halle. After returning home, Mosher became an instructor in the department of anatomy at the Massachusetts Eye and Ear Infirmary and the Harvard Medical School.

He started the first course in sinus anatomy in the United States. This course was to become famous for its content and its progenitor and was appropriately named "Mosher's course". It endured for 35 years.

In 1919 he was appointed Professor of Laryngology at the Harvard Medical School and Chief of Laryngology at the Massachusetts General Hospital. In 1932 he was appointed to the Walter Augustus LaCompte Chair of Otology at Harvard and at age 66 became the second individual to hold two chairs at Harvard. Dr. Mosher was a member and became the president of all of our prominent national otolaryngology societies. When the American Board of Otolaryngology was formed in 1924 (the second certification board after ophthalmology in 1917*) he was chosen as its president and served in that capacity for 25 years. He was the recipient of the Semon Medal from the Royal Society of Medicine of London, the Gold Medal from the American Laryngological Association, and a service medal from the American Academy of Ophthalmology and Otolaryngology. He is known for his intranasal ethmoidectomy technique and his method for the removal of safety pins swallowed by babies, for which he was given a citation by the American College of Surgeons in 1934.

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*Deliberations and progress in our specialty were interrupted by World War I. Also, there was growing resistance to authority to regulate specialty education and training--in essence, the transition from apprenticeships to formal training programs as we know them today. The need was urgent because some form of evaluation of physicians was needed to supplement the general licensing regulations of the various states' Boards of Public Health.

MOSHER AWARD RECIPIENTS

1957. . . . . Harold G. Tabb, MD
1958. . . . . Jack V.D. Hough, MD
. . . . . John A. Kirchner, MD
1959. . . . . Maurice Schiff, MD
1960. . . . . Walter A. Petryshyn, MD
. . . . . Alex Weisskopf, MD
1961. . . . . Godfrey E. Arnold, MD
1962. . . . . Wesley E. Compere, MD
1963. . . . . Edward G. McCoy, MD
. . . . . William W. Montgomery, MD
. . . . . Henry J. Rubin, MD
1964. . . . . Hugh O. Barber, MD
1965. . . . . Brian F. McCabe, MD
1966. . . . . No award
1967. . . . . Frank N. Ritter, MD
. . . . . George T. Singleton, MD
1968. . . . . Leslie Bernstein, MD
1969. . . . . David A. Hilding, MD
. . . . . Lindsay L. Pratt, MD
1970. . . . . Herbert H. Dedo, MD
1971. . . . . Byron J. Bailey, MD
1972. . . . . Hugh F. Biller, MD
1973. . . . . Mark May, MD
. . . . . Andrew W. Miglets, MD
1974. . . . . Robert W. Cantrell, MD
1975. . . . . Donald G. Sessions, MD
1976. . . . . No award
1977. . . . . Donald B. Hawkins, MD
1978. . . . . Robert A. Jahrsdoerfer, MD
1979. . . . . Arnold M. Noyek, MD
1980. . . . . H. Bryan Neel III, MD PhD
1981. . . . . Bruce A. Feldman, MD
1982. . . . . Roger L. Crumley, MD
1983. . . . . S. George Lesinski, MD
1984. . . . . Irwin F. Stewart, MD
1985. . . . . Frank E. Lucente, MD
1986. . . . . Harold C. Pillsbury, MD
1987. . . . . James N. Thompson, MD
1988. . . . . Thomas V. McCaffrey, MD
1989. . . . . Arnold Komisar, MD
. . . . . Bernard R. Marsh, MD
1990. . . . . Patrick J. Gullane, MD
1991. . . . . Robin T. Cotton, MD
1992. . . . . Myles L. Pensak, MD
1993. . . . . Ronald A. Hoffman, MD
1994. . . . . Robert Sofferman, MD
1995. . . . . Fred Herzon, MD
1996. . . . . Stimson P. Schantz, MD
1997. . . . . Scott C. Manning, MD
1998. . . . . No award
1999. . . . . Dennis S. Poe, MD
2000. . . . . Lyon L. Gleich, MD
. . . . . David J. Terris, MD
2001. . . . . Joseph G. Feghali, MD
2002. . . . . Wendell G. Yarbrough, MD
2003. . . . . Edwin M. Monsell, MD PhD
2004. . . . . Craig A. Buchman, MD
2005. . . . . Francisco J. Civantos, MD
2006. . . . . Henry T. Hoffman, MD
. . . . . Dana M. Thompson, MD
2007. . . . . Erin D. Wright, MD
2008. . . . . Robert C. O'Reilly, MD
2009. . . . . Steven J. Wang, MD
2010. . . . . Adrian L. James, MD
2011. . . . . Robert L. Ferris, MD PhD
2012. . . . . Nira A. Goldstein, MD MPH
. . . . . Judith E.C. Lieu, MD MSPH
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2021. . . . . Kevin D. Brown, MD PhD
2022. . . . . Theodore R. McRackan, MD

EDMUND PRINCE FOWLER AWARD

Given in recognition of the excellence of the Candidate's Thesis in Basic Research. This honor was created to perpetuate the ideals of the great teacher for whom it was named and to bestow upon a worthy recipient the responsibility of furthering the highest standards of perfection in the study, teaching and practice of Otolaryngology.

Edmund Prince Fowler • 1872-1966

It says something about the intellectual wealth of the Triological Society that Edmund Prince Fowler Sr., MD, succeeded Max Goldstein, MD, as president in 1932. Both were giants in otology, prolific authors and advocates for the hard of hearing. In honor of Dr. Fowler's contributions to otolaryngology, the Society established The Edmund Prince Fowler Award in 1971, given each year for the best thesis in basic research.

After earning his MD from Columbia University, Dr. Fowler joined the Manhattan Eye and Ear Hospital and became a clinical professor at Columbia University in 1933. He was a decorated colonel of World War I. He was president of the American Otological Society in 1937, recipient of the first Award of Merit from that society in 1952 and founder of the first hearing center in the United States (in New York City). To the legacy of the prodigious researcher and "Dean of Audiology", as he was called, we attribute the invention of the modern clinical audiometer. He tested many patients and soon became aware of the fact that some patients with severe or unilateral losses had suprathreshold hearing values, a condition he coined as "recruitment". This clinical finding resulted in the Alternate Binaural Loudness Balance test, the first to separate cochlear from retrocochlear losses.

In his address to the sections in January 1932, Dr. Fowler described specific recommendations for hearing tests on schoolchildren. He also asked his colleagues to be thoughtful: "Let us not forget to treat the patient as a sensitive human being," he said, "and aid him in surmounting the drawbacks and psychological reactions to his disability."

At the 38th Annual Meeting in Atlantic City, NJ, in 1932, Dr. Fowler shared the spotlight with Edward B. Dench, MD, first president of the Triological, then 72 years old. (Dr. Dench had been named Honorary President of the Society in 1931 until his death in 1936.) At the meeting, George Richards, MD, editor of the Transactions, outlined a list of guidelines for submissions. During the same meeting the council approved a resolution supporting the ABO and its work in raising educational standards in the specialty as part of an effort to stem the tide of proposals for examinations for specialists by each of the 48 states.

Dr. Fowler died in 1966, six months after the last of his 113 papers was presented (at 94 years of age!) at a meeting of the American Otological Society.

Fowler Award Recipients

1971. . . . . Richard R. Gacek, MD
1972. . . . . Duane W. Nagle, MD
. . . . . .Raimund G. Rueger, MD
1973. . . . . Robert J. Ruben, MD
1974. . . . . Robert I. Kohut, MD
. . . . . Willard B. Moran, Jr., MD
. . . . . Gershon J. Spector, MD
1975. . . . . .Gregory J. Matz, MD
. . . . . Richard L. Vorhees, MD
1976. . . . . Shokri Radpour, MD
1977. . . . . .LaVonne Bergstrom, MD
1978. . . . . .Diran O. Mikaelian, MD
1979. . . . . William L. Meyerhoff, MD
. . . . . Clarence T. Sasaki, MD
1980. . . . . Robert A. Schindler, MD
1981. . . . . Don E. Gebhart, MD
1982. . . . . .Michael E. Johns, MD
1983. . . . . Bruce W. Jafek, MD
1984 . . . . . .David E. Schuller, MD
1985. . . . . Marvin P. Fried, MD
1986. . . . . Michael Friedman, MD
1987. . . . . .Stanley M. Shapshay, MD
1988. . . . . Timothy T.K. Jung, MD
1989. . . . . .Robert T. Sataloff, MD
1990. . . . . .Soly Baredes, MD
1991. . . . . .Douglas E. Mattox, MD
1992. . . . . Vanessa G. Schweitzer, MD
1993. . . . . Ralph F. Wetmore, MD
1994. . . . . .Paul Lambert, MD
1995. . . . . Michael Pratt, MD
1996. . . . . .P. Ashley Wackym, MD
1997. . . . . Allen Hillel, MD
. . . . . .D. Bradley Welling, MD
1998. . . . . .No award
1999. . . . . .Debra L. Tucci, MD
2000. . . . . .Rick A. Friedman, MD
. . . . . Michael D. Seidman, MD
2001. . . . . J. Christopher Post, MD
2002. . . . . Richard D. Kopke, MD
2003. . . . . .Chung-Ku Rhee, MD PhD
2004. . . . . Shawn D. Newlands, MD
2005. . . . . Steven W. Cheung, MD
2006. . . . . Alan G. Micco, MD
2007. . . . . .Bradley W. Kesser, MD
2008. . . . . Eric M. Genden, MD
. . . . . .Marlan R. Hansen, MD
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2011. . . . . Stacey L. Halum, MD
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2013. . . . . Subinoy Das, MD FACS
2014. . . . . Hinrich Staecker, MD PhD
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2017. . . . . .Syed F. Ahsan, MD FACS
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2020. . . . . Alexander Gelbard, MD
2021. . . . . .Adam J. Luginbuhl, MD
2022. . . . . .Steven J. Eliades, MD PhD

MAUREEN HANNLEY AWARD

Given in recognition of the excellence of the Candidate's Thesis in an Alternative Science category. This honor was created in 2016 to honor Dr. Hannley's contributions and legacy to the Triological Society. She was the Society's Thesis and Research Grants consultant from 2006 to 2015. Dr. Hannley assisted young researchers and mentored candidates for Triological Fellowship, assisting them with preparation of their theses.

Maureen Hannley • 1942-2015

Maureen Hannley, PhD, was a dedicated advisor and respected for her commitment to advance the mission of the Society to attract the best minds in otolaryngology. Her tireless work assured that the quality of the contributions of the candidates reflected the honor and prestige of membership. As the diversity of the academic and scientific work of the otolaryngology community evolved, Dr. Hannley acknowledged the importance of alternative scholastic contributions to our Society that fall outside the traditional basic and clinical research paradigms. This award is annually bestowed upon the candidate whose thesis represents an outstanding contribution in the alternative science category of Technology/Procedure Development, Otolaryngology Status and Trends, Health Services Research, or Historical Perspectives.

Maureen Hannley, PhD received her M.A. from the University of Arizona and a Ph.D. in Hearing Science and Biocommunication from Baylor College of Medicine. Throughout her academic and research career, she held appointments at Louisiana State University, Kresge Hearing Research Laboratory, Stanford University School of Medicine, Duke University, Medical College of Wisconsin and, most recently, was a Professor in the Department of Otolaryngology at University of Arizona. Dr. Hannley held many administrative appointments, including that of Chief Research Officer at the AAO-HNSF and Health Services Administrator and Director of the Hearing Research Program at NIDCD. She lent her expertise to numerous advisory boards including NIH, ARO, SUO, and Boys Town National Research Hospital, to name a few. She was elected as an Honorary Triological Society Fellow in 2009.

Hannley Award Recipients

2016. . . . . Paul Hong, MD FRCSC
2017. . . . . Kofi D. Boahene, MD FACS
2018. . . . . James C. Denneny, MD FACS
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2001. . . . . William H. Lindsey, MD
2002. . . . . No Award
2003. . . . . Sujana S. Chandrasekhar, MD
2004. . . . . Joseph Sniezek, MD
2005. . . . . Cliff A. Megerian, MD
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. . . . . Richard L. Scher, MD
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. . . . . J. Paul Moxham, MD
2008. . . . . No Award
2009. . . . . No Award
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. . . . . Natasha Mirza, MD
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. . . . . Gerald E. Merwin, MD (posthumous)
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1995. . . . . Kevin A. Shumrick, MD
. . . . . Robert C. Wang, MD
1996. . . . . Author Unknown
1997. . . . . George S. Goding Jr., MD
. . . . . Joseph Haddad Jr., MD
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TRIOLOGICAL SOCIETY
124TH ANNUAL MEETING AT COSM
HYATT REGENCY, DALLAS, TEXAS

FRIDAY, APRIL 29, 2022

Landmark B Ballroom

7:00 ***Business Meeting and New Fellow Ceremony and Reception (Triological Fellows only)***

8:00 **Welcome and Introductions by President**
Michael S. Benninger, MD FACS, Cleveland, OH

Presidential Citations
Jean Abitbol, MD, Paris, France
Brian B. Burkey, MD FACS, Vero Beach, FL
Dennis H. Kraus, MD FACS, Centennial, CO
Kathleen L. Yaremchuk, MD MSA, Detroit, MI

8:15 **Introduction of Guest of Honor and Remarks**
Modern Care of the Professional Voice: An Historical Perspective
Robert T. Sataloff, MD DMA FACS, Philadelphia, PA

8:35 **Presidential Address**
Otolaryngology Education in Evolution
Michael S. Benninger, MD FACS, Cleveland, OH

8:50 **Introduction of Joseph H. Ogura, MD Annual Lecturer**
Artificial Intelligence and Quantum Computing in Medicine
Lara Jehi, MD MHCDS, Cleveland OH

9:25 **Introduction of 2022 Thesis Award Presentations**
Daniel G. Deschler, MD FACS, Boston, MA, Thesis Chair

9:30 **2022 HARRIS P. MOSHER AWARD FOR CLINICAL RESEARCH THESIS PRESENTATION**
Development and Implementation of the Cochlear Implant Quality of Life (CIQOL) Functional Staging System
Theodore R. McRackan, MD MSCR, Charleston, SC

Objectives: The purpose of this study is to develop and implement a functional staging system using the Cochlear Implant Quality of Life (CIQOL) framework. The CIQOL-35 Profile was developed and validated following a rigorous research design and found to be more comprehensive and psychometrically sound than previous patient-reported outcome measures (PROMs) applied to adult CI users. However, interpreting CIQOL-35 Profile (and all PROM) scores remains difficult for patients and clinicians in terms of real world situations, which limits the capacity of PROMs to direct clinical care. To address this limitation, functional staging systems based on PROM scores provide detailed descriptions of patients' self-reported abilities (clinical vignettes) without sacrificing the inherent value of the psychometrically derived scores. The current study (1) creates an evidence based CIQOL functional staging system using advanced psychometric techniques; (2) confirms the clarity and meaningfulness of the staging system with patients; and (3) implements the staging system to measure CIQOL stage progression using a longitudinal study design. Methods: Item response theory (IRT) analyses of CIQOL-35 Profile data from 705 experienced adult CI users and expert opinion were used to determine the cut scores that separated adjacent stages for the 6 CIQOL-35 domains (communication, emotional, entertainment, environment, listening effort, and social). The research team then created clinical vignettes based on item response patterns for each stage. Semi-structured key informant interviews were conducted with 10 adult CI users to determine the clarity and meaningfulness of the CIQOL stages and associated clinical vignettes. Finally, we prospectively collected CIQOL-35 Profile scores from 42 CI users prior to cochlear implantation and then at 3 and 6 months post-CI activation to measure CIQOL stage progression. Results: Psychometric analyses identified 5 statistically distinct stages for the communication domain and 3 stages for all other domains. Using IRT analysis results for guidance, research team members independently identified the cut-scores that represented transitions between the functional stages for each domain with excellent agreement (κ= 0.98 [95% confidence interval 0.96-0.99]). Next, the key informant interviews revealed that CI users found the clinical vignettes to be clear and only minor changes were required. Participants also agreed that stage progression represented meaningful improvements in functional abilities. Finally, 88.1% (n=37) of patients in the

prospective cohort improved by at least one functional stage in one or more domains. The communication domain had the greatest number of patients improve by one or more stages (59.5%) and the social domain the fewest (25.6%). There was also a trend for patients at higher pre-CI functional stages to have less improvement at 3 and 6 months post-CI activation. Conclusion: The new CIQOL functional staging system provides an evidence-based understanding of the real-world functional abilities of adult CI users across multiple domains and study results provide the proportion of CI users in each stage. Results can be used during discussions of expectation with potential CI users to provide enhanced insight regarding realistic outcomes and the anticipated timing for improvements. The use of the CIQOL functional staging system also presents an opportunity to develop goal based rehabilitation strategies that target barriers to stage advancement faced by individual CI users.

9:40 2022 EDMUND PRINCE FOWLER AWARD FOR BASIC RESEARCH THESIS PRESENTATION
Effects of Cortical Stimulation on Feedback Dependent Vocal Control in Non-Human Primates
Steven J. Eliades, MD PhD, Philadelphia, PA

Objectives/Hypothesis: Hearing plays an important role in our ability to control voice, and perturbations in auditory feedback result in compensatory changes in vocal production. The auditory cortex (AC) has been proposed to be an important mediator of this behavior, but causal evidence for this role is lacking. We therefore sought to test this, hypothesizing that the AC is necessary for vocal self-monitoring and feedback dependent control, and that altering activity in the AC during vocal production will interfere with such vocal control. Study Type: Experimental animal study. Methods: We implanted two marmoset monkeys (C*allithrix jacchus*) with electrode arrays in bilateral ACs. Acoustic signals were recorded from vocalizing marmosets while altering vocal feedback or electrically stimulating the AC during random subsets of vocalizations. Feedback was altered by real time frequency shifts (±2 semitones) and presented through headphones. Electrical stimulation was triggered during vocalization and delivered through individual electrodes. We analyzed recordings to measure changes in vocal acoustics during shifted feedback and stimulation, and to determine their interaction. Results were correlated with stimulation parameters, as well as anatomic location and frequency tuning of stimulation sites. Results: Consistent with previous results, we found electrical stimulation alone evoked changes in vocal production. Results were stronger in the right hemisphere but decreased with lower stimulation currents or repeated stimulation sessions. Simultaneous stimulation and shifted feedback significantly altered feedback vocal control for a subset of stimulation sites, deceasing feedback compensation at some sites and increasing it at others. Inhibited compensation was more likely at sites closer to vocal mean frequencies. Conclusions: Results provide causal evidence that the auditory cortex is involved in feedback- dependent vocal control, that it is sufficient and may also be necessary to drive changes in vocal production.

9:50 2022 MAUREEN HANNLEY FOR ALTERNATIVE SCIENCE AWARD THESIS PRESENTATION
Surgeon Thyroidectomy Case Volume Impacts Disease Free Survival in the Management of Well Differentiated Thyroid Cancer
Antoine Eskander, MD ScM FRCSC, Toronto, ON Canada

Objectives: To assess the association between surgeon thyroidectomy case volume and disease free survival (DFS) for patients with well differentiated thyroid cancer (WDTC). A secondary objective was to assess a surgeon volume cutoff to optimize outcomes in those with WDTC. We hypothesized that surgeon volume will be an important predictor of DFS in patients with WDTC after adjusting for hospital volume and other important sociodemographic and clinical factors. Study Design: Population based cohort study. Retrospective. Health services research. Methods: WDTC patients in Ontario, Canada, who underwent thyroidectomy confirmed by both hospital level and surgeon level administrative data between 1993 and 2017, comprised our cohort (N = 37,233). Surgeon and hospital volumes were calculated based on number of cases performed in the year prior by the physician and at an institution performing each case, respectively and divided into quartiles. A multilevel hierarchical Cox regression model was used to estimate the effect of volume on disease free survival (DFS). Results: A crude model without patient or treatment characteristics demonstrated that both higher surgeon volume quartiles ($p<0.001$) and higher hospital volume quartiles ($p<0.001$) were associated with DFS. After controlling for clustering and patient/treatment covariates and hospital volume, moderately low (18-39/year) and low (0-17/year) volume surgeons (HR: 1.23, 95% CI: 1.09-1.39 and HR: 1.34, 95% CI: 1.17-1.53 respectively) remained an independent statistically significant negative predictor of DFS. Conclusions: Both high volume surgeons and hospitals are predictors of better DFS in patients with WDTC. DFS is higher among surgeons performing more than 40 thyroidectomies a year.

10:00 ***Break/Visit Exhibitors/Visit Posters***

10:30 - 12:00 CONCURRENT SESSIONS

Concurrent Session 1A
Pediatric Otolaryngology - Landmark B

10:30 - 11:15 PEDIATRIC OTOLARYNGOLOGY PANEL

Patient Safety and Quality in Pediatric Airway

Moderator:

Mark E. Gerber, MD FACS, Phoenix, AZ

Panelists:

Shelagh A. Cofer, MD, Rochester, MN
Alessandro de Alarcon, MD MPH, Cincinnati, OH
Michael E. McCormick, MD, Milwaukee, WI

11:15 Q&A

Moderators:
Michael J. Biavati, MD FACS, Dallas, TX
Anna H. Messner, MD, Houston, TX

11:20 The Effect of Oral Guaifenesin on Pediatric Chronic Rhinitis: A Pilot Study

Kelley M. Dodson, MD FACS, Richmond, VA; Yula A. Indeyeva, MD, Austin, TX; Jonathan Ma, MD, Richmond, VA; Melissa Yopp, MA, Richmond, VA; Erika Tokita, MD PhD, Tokyo, Japan; Bruce K. Rubin, MD, Richmond, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the effect of guaifenesin on pediatric chronic rhinitis.

Objectives: To investigate the effectiveness of guaifenesin in the relief of nasal symptoms in children with chronic rhinitis (CR). We hypothesized that guaifenesin use over a 14 day study period would improve subjective nasal complaints in pediatric patients with chronic rhinitis, as measured by the SinoNasal-5 (SN-5) survey. We also hypothesized improvement in nasal volume and cross-sectional area with guaifenesin. Study Design: Randomized, placebo controlled, parallel group, masked clinical trial. Methods: The study consisted of a 14 day, randomized, placebo controlled, parallel group, masked clinical trial of oral guaifenesin for CR in children aged 7-18 years. A 2:1 ratio of subjects on active medication to placebo was used. The study was approved by the Western Institutional Review Board. On initial enrollment and at the conclusion of therapy, the SN-5 was completed by parents, acoustic rhinometry measurements performed, and mucus sampling for rheology was obtained. Results: 30 subjects were enrolled in the study, with 20 receiving guaifenesin and 10 placebo. Treatment with guaifenesin for 14 days produced a significant mean change towards clinical improvement in SN-5 scores compared with placebo ($p=0.013$). There was no significant difference in quality of life assessment scores between the two groups or in any of the acoustic rhinometry parameters. Many of the study subjects had difficulty producing a mucus sample sufficient for analysis. Conclusions: Based upon our pilot data, it appears that guaifenesin treatment may produce objective improvements in pediatric patients with CR. Further research with larger sample sizes, inclusion of children younger than 6, and biophysical mucus analyses is warranted.

11:25 Racial Disparities in the Management of Pediatric Laryngomalacia

Aman M. Patel, BS, Newark, NJ; Vraj P. Shah, BS, Newark, NJ; Ivan N. Filimonov, Newark, NJ; Amar D. Desai, MPH, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the impact of race on the management of inpatient pediatric patients with laryngomalacia.

Objectives: Laryngomalacia is a congenital anomaly involving the partial collapse of soft larynx tissue, commonly resulting in stridor. This study seeks to investigate the impact of race on the management of inpatient pediatric patients with laryngomalacia. Study Design: Retrospective database study. Methods: The 2016 Kid's Inpatient Database was queried for pediatric inpatients with laryngomalacia (ICD-10: Q315). Patient race, as coded in the database, is defined as White, Black, Hispanic, or other. Statistical associations were determined via univariate and multivariable analyses. Results: Of the 8,663 pediatric inpatients with laryngomalacia, 4326 (49.9%) were White, 1678 (19.4%) were Black, 1744 (20.1%) were Hispanic, and 915 (10.6%) were of another race. On univariate analysis, Black (50.4%, $p<0.001$) and Hispanic (40.4%, $p<0.001$) patients were more likely to be in the lowest income quartile compared to White patients (21.9%). On multivariable analysis, Black (mean \$156,290, $p=0.015$) and Hispanic (mean \$201,863, $p<0.001$) patients had greater total charges than White patients (\$126,473). Additionally, Black (16.0 days, $p<0.001$) and Hispanic (16.0 days, $p=0.008$) patients had longer length of stay (LOS) than White patients (12.8 days). Although Black patients had increased odds for requiring ventilation (OR: 1.411, $p<0.001$), odds were similar between Hispanic and White patients (OR: 1.169, $p=0.060$). Mortality in Black ($p=0.297$) and Hispanic ($p=0.554$) patients was similar in comparison to White patients. Conclusions:

Racial disparities exist in the management of pediatric inpatients with laryngomalacia, with Black and Hispanic patients experiencing longer LOS and greater total charges compared to White patients.

11:30 Evaluation of Maternal Diabetes and Sibling History as Potential Risk Factors for Microtia
Ruth Mizu, BS, Houston, TX; Ryan Henry Rochat, MD PhD, Houston, TX; Julian Martinez, MD, Houston, TX; Mica Glaun, MD, Houston, TX; Yi-Chun Liu, MD, Houston, TX

Educational Objective: There are many causes associated with microtia, both environmental and genetic in origin. Recent literature suggests maternal pregestational and gestational diabetes mellitus are risk factors for congenital microtia. However, the literature regarding this relationship is few and studied in small patient populations. Further research, study, and characterization of this relationship in larger patient cohorts is an invaluable opportunity for prenatal intervention and maternal risk factor mediation. At the conclusion of this presentation, the participants should be able to further characterize the association between maternal diabetes mellitus, sibling history of congenital anomalies, and congenital microtia in a larger cohort study.

Objectives: (1) To further characterize the relationship of maternal diabetes and congenital microtia in a large patient sample; (2) to examine the association of sibling congenital anomaly history and congenital microtia; and (3) to identify opportunities for prenatal intervention and mediation of maternal risk factors. Study Design: International review board approval was obtained to perform a retrospective chart review of pediatric and adolescent patients (ages 2 months - 18 years) with a diagnosis of microtia in a large patient sample collected at a children's hospital. Descriptive statistics and chi-square analysis are used to assess data and the significance of maternal diabetes, sibling congenital anomaly history, and other maternal risk factors. Methods: Alongside patient birth history and demographics, maternal health history, age, race/ethnicity, socioeconomic status was collected. Primary outcomes assessed the association of congenital microtia and other congenital otologic defects with a history of maternal diabetes and sibling history of congenital anomalies. A total of 252 pediatric patients with microtia are included in the study. Results: Current procedural terminology (CPT) codes identified 252 children diagnosed with microtia. Of these patients, 46 (18.25%) were found to have bilateral microtia and 206 (81.75%) with unilateral microtia. 140 individuals were found to have right sided microtia and 65 left sided microtia. Maternal parity was found to be a significant risk factor for unilateral or bilateral microtia in infants (p=.041). Preexisting maternal diabetes is a significant risk factor for microtia (p=.03), however maternal gestational diabetes is not a significant risk factor. Children with microtia were also more likely to have a sibling with a congenital anomaly (p=.02). Conclusions: Significant risk factors for microtia include maternal parity, preexisting diabetes, and a history of siblings with a congenital anomaly. Our results support the hypothesis that maternal diabetes is a risk factor for microtia, and the larger population size of our study allowed us to demonstrate this significant relationship between maternal diabetes and microtia in children.

11:35 The Cost Savings of Telemedicine Interventions in Pediatric Surgical Subspecialties: A Systematic Review
Walter Nicholas Jungbauer, BS, Charleston, SC; Rachana Gudipudi, BS, Charleston, SC; Emily Brennan, MLIS, Charleston, SC; Phayvanh Pecha, MD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how telemedicine associated cost savings have been characterized across pediatric surgical specialties.

Objectives: Telemedicine is a rapidly expanding care modality in the United States. Pediatric surgical patients often require complex care which can incur significant expenses, some of which may be alleviated by telemedicine. We reviewed the literature describing telemedicine's impact on the cost of healthcare across pediatric surgical specialties. Study Design: Systematic review using the following databases: PubMed (Medline), Scopus (Elsevier), and CINAHL (EBSCOHost), searched from inception to August 20, 2021. Methods: Studies were included per the following criteria: 1) conducted in the US; 2) described a telemedicine intervention in the context of pediatric surgical care; and 3) provided a metric of telemedicine cost compared to an in-person visit. Results: Nine studies satisfied inclusion criteria, encompassing the following pediatric specialties: general surgery (2), orthopedic surgery (2), urology (2), neurosurgery (1), ophthalmology (1), and otolaryngology (1). The average age was 6.4 ± 2.1 years. There were 868 documented virtual encounters which spanned clinic (44%), postoperative (33%), preoperative (11%) and diagnostic/screening (11%) visits. Of the studies which calculated cost, the mean savings was $150.01 ± $114.42 per telemedicine visit. Over half (55.6%) of studies included families who spared more than 1.5 hours or 100 miles of travel by attending virtual visits. One study documented more than 50% of telemedicine appointments were billed as level 4 visits. Conclusions: This systematic review suggests telemedicine provides cost incentives to pediatric surgical care in certain scenarios. Future work should be directed towards standardizing the metrics by which cost savings are analyzed and detailing which types of visits are most appropriately facilitated by telemedicine.

11:40 Efficacy of Tranexamic Acid for Post-Tonsillectomy Hemorrhage
Maxwell D. Newby, MD, Morgantown, WV; Brian Kellermeyer, MD, Morgantown, WV

Educational Objective: At the conclusion of this presentation, the participants should be able to evaluate indications, dosages, and advantages of tranexamic acid usage in post-tonsillar hemorrhages after adenotonsillectomies.

Objectives: To compare the effectiveness of application of tranexamic acid to the standard of care of operative recauterization for

tonsillar hemorrhages and its safety profile. Study Design: Retrospective chart review. Methods: A retrospective chart review was performed on 1,603 patients who underwent tonsillectomy and/or adenoidectomy over a two year period at a tertiary care hospital with continuous otolaryngologic coverage. Patient data collected included patient age, BMI, ASA number, and past medical history of bleeding disorders. We then separated patients into two cohorts - those that had postoperative tonsillar hemorrhage and those who did not. Of the patients who had postoperative tonsillar hemorrhage, patients were then further divided into groups based on the specific treatment intervention(s). Intervention types included observation only, TXA only, OR only, and combination of these interventions. To evaluate and compare interventions across the intervention groups, postoperative bleeding day, length of hospital stay, and other postoperative complications were studied. Comparisons among these four groups were analyzed with ANOVA testing ($p < 0.05$ significance). Results: The average timeframe from surgery to postoperative bleeding was 6.29 days. The average for each group was 7 days, 6 days, 4.95 days, and 5.41 days for the observation only, TXA only, OR only, and multiple intervention groups respectively. Among the patients with postoperative tonsillar hemorrhages, the average length of hospital stay was 0.96 days, 1.2 days, 1 day and 1 day for the observation only, TXA only, OR only, and multiple intervention groups respectively. The f ratio value was 0.13017 with a p value of .941886 ($p < 0.05$). There were no postoperative complications with the administration of TXA for post-tonsillectomy hemorrhage. Conclusions: There was no statistically significant difference of length of hospital stay among those with postoperative hemorrhage who were given TXA in comparison to those who were monitored for observation, underwent OR interventions, or patients with multiple intervention group. TXA should be considered as valid therapeutic option for patients that have post-tonsillectomy hemorrhage to reduce patient and parent mental distress, utilization of healthcare resources, and repeated anesthesia exposures within the pediatric population.

11:45 A Longitudinal Analysis of the Family Impact of Pediatric Tracheostomy

Erin Wynings, MD, Dallas, TX; Ashley F. Brown, MS CCC-SLP BCS-S, Dallas, TX; Rebecca L. Brooks, MSN APRN RNC-NIC PCNS-BC, Dallas, TX; Yann Fuu Kou, MD, Dallas, TX; Stephen R. Chorney, MD MPH, Dallas, TX; Romaine F. Johnson, MD MPH, Dallas, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize how pediatric tracheostomy impacts the family's quality of life.

Objectives: To study the longitudinal effects of pediatric tracheostomy impact on the family's quality of life. Study Design: Cross-sectional analysis. Methods: We performed a longitudinal analysis of QOL of families with children with tracheostomies using the PedsQL Family Impact module - a validated QOL instrument. The family's mean PedsQL scores were compared between index hospitalization, chronic tracheostomy children, and changes over time using mixed effect multiple linear regression. We compared changes in PedsQL score by demographics, indications for tracheostomy, neurocognitive disability, and the child's current status. We further compared these scores to healthy children. Results: N=255 surveys were collected from 2018-2021. N=62 (26%) were from families at the time of tracheostomy placement. Eighty-two families (32%) filled out multiple surveys. Acute survey children were younger (3.6y vs. 6.9y), non-Hispanic (N=54, 82% vs. 68%), and not severely neurocognitively disabled (52% vs. 74%) when compared to chronic tracheostomy families (all $P < .01$). The mean total QOL impact score was 78.9 (SD=13.5). These scores were lower than families with healthy children (n=717, mean (SD) = 87.61 (12.33), 95% CI for difference = -10.52 to -6.82). QoL scores did not change over time except for improved emotional functioning (mean difference = 6.07, P=.01, 95% CI = 0.72 - 11.42). After controlling for time since tracheostomy both complex patient type (B=-4.06, P=.03, 95% CI= -7.81 to -0.31) and male sex (B=-3.86, P=.04, 95% CI= -7.58 to -0.14) affected QOL. Also, families where the child eventually died reported better QOL scores (B=5.89, P=.02, 95% CI=1.00 to 10.78). Conclusions: Family QOL remains stable over time for those with tracheostomy dependent children while remaining lower than families of healthy children.

11:50 Impact of Concomitant Tonsillectomy on Outcomes and Cost in Pediatric Adenoidectomy

Vraj P. Shah, BS, Newark, NJ; Aman M. Patel, BS, Newark, NJ (Presenter); Sean Z. Haimowitz, BS, Newark, NJ; Kendyl Barron, BA, Newark, NJ; Christina H. Fang, MD, Bronx, NY; Jean Anderson Eloy, MD, Newark, NJ; Christen Caloway, MD, Newark, NJam

Educational Objective: At the conclusion of this presentation, the participants should be able to understand differences in management of pediatric patients undergoing adenoidectomy with and without concomitant tonsillectomy in the context of a database study.

Objectives: Adenoidectomy is a common procedure that is often performed in conjunction with a tonsillectomy. This study investigates differences in between pediatric patients undergoing adenoidectomy alone and with concomitant tonsillectomy (T&A). Study Design: Retrospective database review. Methods: The 2016 Kid's Inpatient Database was used to identify pediatric patients undergoing adenoidectomy by external approach (ICD-10-PCS: 0CTQXZZ) with and without tonsillectomy (ICD-10: 0CTP, 0CBP). Postoperative respiratory complications were identified via ICD-10 codes. Univariate and multivariable analyses were performed to determine statistical associations. Results: Of the 4,000 identified patients undergoing adenoidectomy, 442 did not undergo tonsillectomy. Those who underwent adenoidectomy alone were younger than those who underwent T&A (mean 3.5 vs. 5.1 years, $p<0.001$) and more likely to be White (44.9% vs. 37.6%, p=0.002). Upon multivariable analysis, those who underwent adenoidectomy alone had similar costs to those with T&A ($48,978 vs. $35,388, p=0.426). Patients who underwent adenoidectomy alone had longer length of stays (LOS) (4.0 vs. 2.5 days, p=0.009) and were more likely to undergo bronchoscopy (OR 1.51, 95% 1.04-2.19,

p=0.030). There was no significant difference in risks for postoperative respiratory complications between those who underwent adenoidectomy alone and with T&A (OR 0.94, 95% CI 0.60-1.47, p=0.781). Conclusions: Adenoidectomy is frequently performed in conjunction with tonsillectomy in pediatric patients. Those who underwent adenoidectomy alone had longer LOS and were more likely to undergo bronchoscopy, but had similar risk for respiratory complications compared to those who underwent T&A.

11:55 **Q&A**

12:00 ***Lunch/Visit Exhibitors/Visit Posters***

Concurrent Session 1B
Otology & Neurotology - Landmark A

10:30 - 11:15 **OTOLOGY & NEUROTOLOGY PANEL**

Expanded Indications for Cochlear Implantation

Moderator:

Elina F. Kari, MD, Del Mar, CA

Panelists:

Expanded Adult Cochlear Implantation - Hearing Preservation, Individual Ear Indications, Asymmetric Hearing Loss; Potentially Difficult Surgical Cases (Otosclerosis, Otitis Media)

Oliver F. Adunka, MD, Columbus, OH

Expanded Adult Cochlear Implantation - Cochlear Implantation in Older Adults and Adults with Cognitive Impairment; Acoustic Neuromas, Meniere's

Richard K. Gurgel, MD, Salt Lake City, UT

Pediatric Expanded Indications - Age at Implantation, SSD, Congenital Abnormalities of Cochleovestibular Nerves and/or Malformations

Brian D. Nicholas, MD FACS, Syracuse, NY

11:15 **Q&A**

Moderators:
J. Walter Kutz, MD FACS, Dallas, TX
Syed F. Ahsan, MD FACS, Anaheim, CA

11:20 **WITHDRAWN -- Comparison of Exposure Extent in Classic and Modified Infratemporal Fossa Type A Approaches to the Jugular Foramen**

Ashley M. Nassiri, MD MBA, Rochester, MN; Luciano C. Leonel, PhD, Rochester, MN; Maria Peris-Celda, MD PhD, Rochester, MN; John I. Lane, MD, Rochester, MN; Jamie J. Van Gompel, MD, Rochester, MN; Matthew L. Carlson, MD, Rochester, MN

11:25 **Mixed Effect of Race and Socioeconomic Status on Delayed Sensorineural Hearing Loss Diagnosis and Cochlear Implantation**

Geethanjeli N. Mahendran, BS, Atlanta, GA; Ching Siong Tey, BS, Atlanta, GA; Rahiq Rahman, Atlanta, GA; Nandini Govil, MD MPH, Atlanta, GA; Candace E. Hobson, MD, Atlanta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact of race and socioeconomic status on delayed sensorineural hearing loss diagnosis and cochlear implantation.

Objectives: To determine whether certain pediatric populations are at risk for delayed cochlear implantation. Study Design: Retrospective study. Methods: Demographic data was collected for pediatric patients who underwent cochlear implantation between January 1, 2013, and September 1, 2021. Dates of diagnosis of hearing loss by auditory brainstem response, radiological imaging, surgical consultation with an otolaryngologist and implantation were also collected. Results: 145 pediatric patients underwent cochlear implantation. 57.2% (83) identified as White, 32.4 % (47) as Black, and 5.8% (9) as Asian. The mean age at diagnosis and implantation was 2.36 (± 3.19) years and 4.24 (± 4.25) years, respectively. Black patients were 0.61 (± 0.58) years older than White patients at the time of diagnosis (p=0.046; CI= -0.54 -1.77). Among families with median household income (MHI) above our state's MHI, Black patients were 0.98 years (± 0.67) years older than White patients at time of diagnosis (p=0.008; CI: -0.35-2.31). Overall, White patients took 0.52 (± 0.44) years longer to progress from diagnosis to implantation than Black patients (p=0.044; CI= -0.34-1.39). Among families with MHI above our state's MHI, White patients took 1.37 years longer to progress from diagnosis to implantation than Black patients (p=0.043; CI: -0.49-3.24). Conclusions: Black pediatric patients, especially those of lower socioeconomic status (SES) are at risk of delayed diagnosis of sensorineural hearing loss. In contrast, White pediatric patients, particularly those of higher SES, take longer to progress from diagnosis to implantation. Given the impact of early diagnosis and treatment, it is important identify patients at risk for delayed intervention.

11:30 Middle Cranial Fossa Decompression for Treatment of Recurrent Facial Nerve Palsy: Prevalence and Surgical Outcomes

Yohan Song, MD, Boston, MA; Christopher McHugh, MD, Boston, MA; Jennifer Tirino, MD, Boston, MA; Tessa Hadlock, MD, Boston, MA; Felipe Santos, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the prevalence and surgical outcomes of middle fossa decompression for recurrent facial nerve palsy.

Objectives: To investigate the surgical outcomes in patients treated for recurrent facial nerve palsy (RFP) at a quaternary facial nerve referral center. Study Design: Retrospective case control study. Methods: A retrospective chart review was performed on 132 patients with RFP who presented to our institution's facial nerve clinic from 2001-2021. Records were analyzed for etiology of palsy, facial nerve function and recurrence rates. Pre and postoperative audiometric outcomes were also assessed in surgically managed patients. Results: 248 patients with RFP were identified, and 132 patients met criteria to be surgical decompression candidates. Of these, 6.8% underwent surgical decompression. For patients who did not undergo surgery, the House-Brackmann (HB) score was 2.9 ± 1.3 (SD) at the initial clinic visit, and 2.4 ± 1.3 (SD) at the last clinic visit. This difference was significantly different ($p = 0.01$, t-test). For surgical patients, the preoperative HB score was 2.9 ± 0.9 (SD) and postoperative HB score was 1.8 ± 0.6 (SD), which were significantly different ($p = 0.01$, t-test). The number of facial palsy episodes also decreased pre and postoperatively from 3.5 ± 0.8 (SD) to 0.2 ± 0.4 (SD) episodes, which were significantly different ($p<0,001$, t-test). There were no significant differences in the starting facial nerve function between nonsurgical and surgical groups ($p = 0.91$, t-test). Audiometric outcomes were not significantly different pre- and post-surgery ($p=0.31$, t-test for PTA; $p=0.34$, t-test for WRS). Conclusions: Facial nerve decompression for RFP patients with incomplete functional recovery may be an effective treatment for decreasing the frequency and severity of facial palsy episodes.

11:35 Development of Binaural Hearing Abilities after Long Term Use for Cochlear Implant Recipients with Unilateral or Asymmetric Hearing Loss

Nicholas Thompson, MD, Chapel Hill, NC; Margaret Dillon, AuD, Chapel Hill, NC; Emily Buss, PhD, Chapel Hill, NC; Meredith Rooth, AuD, Chapel Hill, NC; Harold Pillsbury, MD, Chapel Hill, NC; Kevin Brown, MD PhD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the development of binaural hearing abilities for cochlear implant recipients with unilateral or asymmetric hearing loss and variables that may contribute to differences in improvement.

Objectives: To assess development of binaural hearing abilities for cochlear implant (CI) users with unilateral hearing loss (UHL) or asymmetric hearing loss (AHL) with 5 years of CI listening experience. Study Design: Prospective cohort. Methods: Adults with UHL or AHL underwent cochlear implantation as part of an FDA approved clinical trial. Binaural hearing abilities were assessed using AzBio sentences with 10 talker masker. Spatial release from masking (SRM) was calculated as the difference in scores when the masker was offset to the CI ear (SRMci) and contralateral ear (SRMcontra) relative to the co-located condition (0 degrees). Tasks were completed preoperatively and at intervals up to 5 years post-activation. Results: 20 UHL and 19 AHL participants completed the clinical trial endpoint (1 year post-activation). Linear mixed models showed a significant main effect of interval and group for SRMcontra. There was a significant interaction of interval and group, with UHL participants reaching asymptotic performance within the initial months of CI use and AHL participants demonstrating continued growth in binaural abilities out to 5 years. There was no correlation between change in SRM and contralateral hearing thresholds ($p=0.060$), but there was a significant correlation with age ($p=0.005$). Conclusions: CI recipients with UHL and AHL experience improved SRM with long term device use. The time course of improvement varied by cohort, with the UHL cohort reaching early asymptote and the AHL cohort continuing to improve. Differences were likely driven by differences in age at implantation, with AHL participants implanted at an older age.

11:40 United States Geographic Region and Patient Travel in Vestibular Schwannoma Care: A Survey Study of the Acoustic Neuroma Association

Eric Y. Du, BS, La Jolla, CA; Amin Mahmoodi, BS, La Jolla, CA; Jeffrey D. Bernstein, MD, La Jolla, CA; Omid Moshtaghi, MD MS, La Jolla, CA; Marc S. Schwartz, MD, La Jolla, CA; Rick A. Friedman, MD PhD, La Jolla, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the influence of regional variation and patient travel in vestibular schwannoma care.

Objectives: Vestibular schwannomas (VS) are relatively rare tumors, thus nationwide investigations have largely been limited to secondary analyses. Herein, we survey VS patients nationally to investigate regional differences and trends of travel for VS care. Study Design: Cross-sectional online survey. Methods: A comprehensive self-reported survey was distributed online between February 2020 and June 2021 via the Acoustic Neuroma Association (ANA) to patient members residing in the United States with a self-reported history of sporadic, radiographically confirmed VS. Results: United States geographic representation was diverse with respondents from 46 states. Of those who answered to geographic region (n=208), a plurality was from the South (n=73, 35.1%) and lived in rural areas (n=80, 38.5%). Median distance traveled for care was 50 miles (range: 1-3500 miles) and the majority

(n=125/213, 58.7%) of respondents received local care (less than 100 miles). Across all regions, distance traveled was negatively correlated with patients' age (r=-0.15, p < 0.05). Southern (≟ü=0.16, p=0.02) and rural (≟ü=0.31, p < 0.01) respondents were more likely to travel over 100 miles as compared to other regions. Patients who travelled over 100 miles tended to pursue treatment at an academic center (≟ü=0.17, p=0.02) and desired invasive or surgical treatment (≟ü=0.29, p < 0.01). Conclusions: Younger and Southern or rural based patients tend to travel farther to seek VS care, and those who did travel tended to seek microsurgical resection at an academic center. The expansion of care into more diverse regional centers may help offset the burden of travel for VS patients.

11:45 Avoiding Ablative Procedures in the Management of Meniere's Disease: The Continued Role of Endolymphatic Mastoid Shunt Surgery
Robert M. Owens, MD, Plano, TX; Eduardo Lopez-Orozco, MD, Guadalajara, Mexico (Presenter)

Educational Objective: At the end of this presentation, the participants should be able to better understand the success of endolymphatic mastoid shunt surgery (EMS) for Meniere's disease (MD) as well as outcomes of patients who fail a primary EMS.

Objectives: To review the outcomes of patients undergoing EMS for uncontrolled Meniere's disease. Study Design: Retrospective chart review. Methods: Records of 243 patients who had an EMS performed in an eight year period. Results: A total of 243 patients underwent EMS for MD. Successful control of vertigo (class A or B) was achieved in 197 patients (81.07%), while 41 patients (16.87%) required an additional procedure to gain control of the vertigo episodes, and 5 patients (2.06%) chose not to have further treatment. Analysis of vertigo control by MD stage demonstrated that patients in earlier stages of disease correlated with better control of vertigo: stage 1 90%, stage 2 83.78%, stage 3 79.2%, and stage 4 61.9%, with a p value of 0.035. Of the 41 patients requiring additional procedures, 25 underwent revision EMS, with 19 (76%) achieving vertigo control, with the revision cases being performed on average 3.73 years after the primary EMS. Ultimately, 22 (9.05%) patients had ablative procedures (10 IT gentamicin, 12 labyrinthectomy). Conclusions: Utilizing EMS surgery as a primary option, we achieved total or excellent control of vertigo in 81.07% of patients. Patients in earlier stages of MD are more likely to achieve vertigo control. In addition, if EMS patients do eventually develop recurrent vertigo, they respond well to revision EMS surgery. We were able to avoid audiovestibular ablative procedures in all except 22 patients (9.05%). Primary and revision EMS surgeries remain an excellent option for MD patients.

11:50 Influence of Listening Environment on Usage Patterns in Cochlear Implant Patients with Single Sided Deafness
Alejandro Garcia, MD, Boston, MA; Afash Haleem, BA, Boston, MA; Divya A. Chari, MD, Boston, MA; Charlotte Morse-Fortier, AuD, Boston, MA; Julie Arenberg, PhD, Boston, MA; Daniel J. Lee, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the differences in cochlear implant (CI) usage between single sided deafness (SSD) patients and bilateral sensorineural hearing loss (biSNHL) patients in different listening environments and how it correlates with auditory performance.

Objectives: Compare data logging of cochlear implant (CI) patients with single sided deafness (SSD) or bilateral sensorineural hearing loss (biSNHL) in different listening environments. Study Design: Retrospective case control study. Methods: We identified adult CI patients with SSD or biSNHL from 2010-2021 and included subjects with usage data collected at 3, 6, and 12 months following device activation. The CI listening environment was defined as speech in noise, speech in quiet, quiet, music, or noise. Speech intelligibility was measured using Consonant-Nucleus-Consonant (CNC) word lists and AzBio sentence testing. Subjective outcomes were quantified using the Client Oriented Scale of Improvement (COSI) and the Tinnitus Handicap Index (THI). Results: 30 SSD CI users were matched with 30 biSNHL CI users. biSNHL patients wore their devices significantly more than SSD patients at 3 months followup (8.97 versus 11.18 hours/day), though there were no differences observed at 6-12 months. Both groups used their CI more for speech in quiet compared to other environments. There was a significant positive correlation (r, 0.63) between device use and CNC scores at 12 months only for SSD subjects. In the COSI survey, subjects with SSD reported a mild improvement in speech understanding in quiet and in noise. SSD subjects had significant improvement in THI scores 12 months after activation compared to preop values. Conclusions: SSD CI users have comparable duration of device usage to biSNHL CI users when measured at longer followup periods with a preference for listening to speech in quiet in both patient populations. Increased CI use correlates with better auditory performance among SSD compared to biSNHL subjects.

11:55 Q&A

12:00 *Lunch/Visit Exhibitors/Visit Posters*

1:00 - 5:00 SCIENTIFIC SESSIONS - LANDMARK B

1:00 - 1:50 FACIAL PLASTICS PANEL

Facial Plastic Surgery: New Approaches in Our Practices

Moderator:

Deborah Watson, MD FACS, San Diego, CA

Panelists:

Jump Starting a Slow Healing Wound to Heal
David B. Hom, MD FACS, San Diego, CA

Telemedicine in Facial Plastic Surgery: Novelty or Necessity?
Anthony P. Sclafani, MD FACS, New York, NY

Virtual Surgical Planning
Sherard A. Tatum, MD FACS, Syracuse, NY

Incorporating Ear Cartilage Back into your Rhinoplasty Cases
Deborah Watson, MD FACS, San Diego, CA

1:50 Q&A

Moderators:
Robert H. Deeb, MD, Detroit, MI
Maria V. Suurna, MD FACS, New York, NY

1:55 The Modified Frailty Index and Facial Fracture Patients: A NSQIP Analysis
Rushi Patel, BA, Newark, NJ; Mehdi S. Lemdani, BA, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the relationship between the modified frailty index and postoperative outcomes in facial trauma patients.

Objectives: The modified frailty index (mFi-5) is a 5 factor based index that has been shown to predict postoperative morbidity. We evaluate the relationship between the mFi-5 and postoperative complications in facial fracture patients. Study Design: Retrospective database review. Methods: The 2005-2018 National Surgical Quality Improvement Program (NSQIP) database was queried for all cases of facial fractures. Each patient received a mFi-5 score from 0 to 5 depending on the number of the following comorbidities they possessed: hypertension requiring medication, diabetes mellitus, congestive heart failure, chronic obstructive pulmonary disease/pneumonia, and dependent functional status. Univariate and multivariate analyses were conducted. Results: A total of 5,220 patients met inclusion criteria. The majority of patients were under the age of 40 (58.4%), male (75.9%), and White (51.6%). The most common mFi-5 score was 0 with 4,237 cases (81.2%) followed by 1 (719, 13.8%) and 2 (238, 4.6%). Compared to patients with mFi-5 of 0, those with a score of 3 had higher rates of life threatening medical complications (8.0% vs. 0.5%), surgical site infections (4.0% vs. 2.1%), and discharge destination other than home (36.0% vs. 4.8%). Multivariate regression analysis revealed significant associations between mFi-5 and septic shock (OR= 3.41 [1.24-9.34], p=0.017), myocardial infarction (OR=7.30 [1.08-49.51], p=0.042), and wound disruption (OR=1.96 [1.22-3.15], p=0.006). Increasing mFi-5 score was associated with a 0.41 day (95% CI=0.04-0.79, p=0.029) marginal increase in length of stay. Conclusions: Increasing mFi-5 score is associated with longer length of stay, septic shock, myocardial infarction, and wound disruption. The mFi-5 can potentially help identify high risk facial fracture patients.

2:00 Identification of an Unmet Need in Adult Craniofacial Care: Facial Dysmorphic Disorder in the Adult Cleft Patient Population
Wesley H. Stepp, MD PhD, Chapel Hill, NC; Eva J. Stein, MD, Denver, CO; Eva Vandooros, BS, Wilmington, NC; Michael Canfarotta, MD, Chapel Hill, NC; Amelia F. Drake, MD, Chapel Hill, NC; Madison Clark, MD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to identify key features of facial dysmorphic disorder, understand its prevalence and identify key elements that should trigger referral to a mental health professional.

Objectives: Facial dysmorphic disorder (FDD), a variant of body dysmorphic disorder, occurs when individuals are preoccupied with perceived defects in their facial appearance. Cleft lip and/or palate (CL/P) requires many clinical interventions and has significant psychological impacts on a patient's perception of appearance. This study identified psychological burdens related to living as an adult with CL/P and characterizes the degree of FDD symptoms in an adult craniofacial population. Study Design: This was a prospective, single center, cross-sectional case control study using semi structured interviews and symptom assessments at a university based craniofacial center. Methods: Patients without CL/P undergoing non-cosmetic facial surgery were recruited as controls (n=20). CL/P patients (n=30). Body Dysmorphic Disorder-Yale Brown Obsessive Compulsive Scale (BBD-YBOCS) scores were collected from control and CL/P patients to assess FDD severity. Interviews were coded using thematic analysis to identify key

elements central to CL/P patients. Results: Demographic factors such as age, biological sex and ethnicity had no significant impact on FDD symptom scores. CL/P patients were more likely to have significant FDD symptoms (BDD-YBOCS > 16) than a non-CL/P patient (OR 11.6, CI95 1.4-99.3), and had a mean difference in FDD symptoms scores of 10.04 (p<0.0001; CI95 5.5-14.6). CL/P patients seen by a mental health provider in the past three months had 3-fold lower overall FDD symptom scores (OR 0.081; CI95 0.0085-0.77). Conclusions: CL/P adults would benefit from treatment for cleft specific needs and psychological support as they face unique stressors related to their appearance, including an increase in FDD associated symptoms. This study emphasizes the importance of recognizing psychological symptoms and providing ongoing multidisciplinary care to adults with CL/P.

2:05 A National Analysis of the Effect of Weekend Admission Status on Facial Fracture Outcomes

Dhvani R. Shihora, BS, Newark, NJ; Aatin K. Dhanda, BA, Newark, NJ; David Cohen, BA, Newark, NJ; Christopher C. Tseng, BS, Newark, NJ; Boris Paskhover, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to determine the effect of weekend admission for patients who received surgical repair of facial fracture.

Objectives: A “weekend effect” has been described as worse outcomes for patients admitted on weekends. In this analysis we seek to determine the effect of weekend admission for patients who received surgical repair of facial fracture. Study Design: Retrospective database analysis. Methods: The National Inpatient Sample (NIS) was used to identify 18,025 patients undergoing facial fracture repair the day of hospital admission from 2003-2014. Variables included patient and hospital demographics. Admissions were assessed by weekend or weekday admission status. Univariate and multivariate analyses were performed. Results: 18,025 patients were identified, with 12,785 (71.43%) weekday admissions and 5240 (29.07%) weekend admissions. A total of 56.7% of weekend admissions were emergency or urgent admissions in comparison to 45.5% for weekdays. Cox regression analysis demonstrated better overall survival for weekend patients (HR: 0.48 95% CI: 0.238-0.969, p<0.05). Patients with higher APR-DRG risk of mortality were found to have higher risk of death (HR: 22.572 95% CI: 3.565-142.91, p<0.001). Weekday admissions were associated with decreased total charges (mean difference: -$5581, 95% CI: -8179 to -2984, p<0.0001) and length of stay (-0.277 days, 95% CI: -0.49 to -0.064, p<0.05) as compared to weekend admission. Multivariate logistic analysis demonstrated no significant difference in mortality during hospitalization or adverse discharge disposition. Conclusions: Weekend admission status may play a role in outcomes following facial fracture repair. Patients admitted on weekdays had significantly decreased length of stay as well as total charges, but no differences in mortality or discharge disposition.

2:10 Patterns and Predictors of Readmission in Patients with Traumatic Fractures of the Mandible

Margaret Irene Engelhardt, MD, Minneapolis, MN; Emma Tran, MD, Minneapolis, MN; Amy Anne Lassig, MD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to describe current national patterns in inpatient hospital management of mandible fractures, recognize common complications requiring inpatient readmission, and identify patient and system related factors associated with increased healthcare utilization.

Objectives: To report the incidence and reasons for 30 day readmissions following initial hospitalization for management of a fractured mandible and to identify predictive factors that lead to significantly higher rehospitalization risk. Study Design: Retrospective cross-sectional analysis of the 2017 Nationwide Readmissions Database (NRD). Methods: Relevant ICD-10 codes were used to identify patients who underwent an index hospitalization for mandible fracture. Univariate analysis was performed with chi square and independent Student t-test. Using multivariate logistic regression, independent predictors of 30 day readmission were identified. Results: We identified 10,991 patients who were admitted for inpatient management of a mandible fracture, of which 292 (2.4%) were readmitted within 30 days of discharge from initial hospitalization (mean age 39.8+/-19.0 years, 78% male). Independent predictors of 30 day readmission were open fractures (OR: 1.54, 95% CI: 1.11-2.10, p=0.008), cigarette smoking (OR: 1.55, CI: 1.16-2.06, p=0.003), opioid use disorder (OR: 2.04, CI: 1.22-3.29, p=0.005), homelessness (OR: 2.32, CI: 1.47-3.59, p<0.001), concurrent mental health diagnosis (OR :2.31, CI: 1.74-3.05, p<0.001), anticoagulant medication use (OR: 2.11, CI: 1.27-3.41, p=0.003), liver disease (OR: 2.25, CI: 1.21-3.94, p=0.007), and presence of a tracheostomy (OR: 25.80, CI: 11.67-56.01, p<0.001). Fractures of the angle (OR: 3.05, CI: 2.12-4.39, p<0.001) and symphysis (OR: 2.97, CI: 2.05-4.30, p<0.001) were the subsites most associated with readmission. Operative intervention during the initial hospitalization (OR: 0.30, CI: 0.21-0.41, p<0.001) and longer duration of stay (OR: 0.91, CI: 0.88-0.94, p<0.001) were associated with decreased risk of readmission. The most common reason for readmission was infection (n=61/292, 21%). Conclusions: Risk factor modification of the described independent predictors of 30 day readmission may improve outcomes and allow for recognition of the patients most at risk for post-injury readmission after a mandible fracture.

2:15 Hidden Otolaryngology Malpractice Claims: An Internal Review from 2000-2020

Mark A. Fadel, MD JD, Pittsburgh, PA; Jennifer McCoy, MA, Pittsburgh, PA; Richard Kidwell, JD, Pittsburgh, PA; Robert Voinchet, JD, Pittsburgh, PA; Jonas T. Johnson, MD, Pittsburgh, PA; Jeffrey P. Simons, MD, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to define captive insurance, understand

the components of a lawsuit, and recognize trends in otolaryngology malpractice claims.

Objectives: To report key characteristics and patterns of captive insurance claims not publicly reported in otolaryngology across a large tertiary level academic health system over the previous two decades. Study Design: Retrospective review. Methods: The internal captive insurance database at a tertiary level healthcare system was queried to identify otolaryngology related malpractice claims regardless of final disposition (settled or dismissed) filed from 2000 to 2020. Date of incident, date of claim, patient age, error type, patient outcome, provider subspecialty, number of defendants, type of defendant, total expenses, disposition, and final reward amount were recorded. Results: Twenty-six claims were identified. Head and neck surgery was the most frequently implicated subspecialty (34.6% of all cases), followed by general otolaryngology (26.9%), skull base/rhinology (19.2%), pediatrics (15.4%), and resident trainee (3.8%). Improper surgical management was cited in 9/24 cases (34.6%), followed by failure to diagnose (26.9%), treat (15.4%), and obtain informed consent (11.5%). A total of 6 (23%) cases had a deceased outcome with 20 (76.9%) alive. A total of 16 (59%) cases settled and 9 (33%) dismissed all parties. Only 3 cases settled on behalf of the individual otolaryngologist whereas the rest on behalf of the hospital. For deceased outcomes, median reward was $500,000, whereas, for alive outcomes, the median reward was $105,000 (p=0.019). Conclusions: This study uniquely analyzes malpractice claims not captured by publicly documented legal dockets or national disclosures. Reward amount was significantly higher in outcomes involving deceased plaintiffs. This data encourages otolaryngologists to better gauge current quality and safety measures that best protect patients from harm.

2:20 Ergonomics in Otolaryngology: A Systematic Review and Meta-Analysis

Matthew T. Ryan, MD, Bethesda, MD; Emily A. Montgomery, MS, Bethesda, MD; Jacob Fryer, BS, Bethesda, MD; Nora Watson, PhD, Bethesda, MD; Charles A. Riley, MD, Bethesda, MD; Anthony M. Tolisano, MD, Bethesda, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the large burden that ergonomic stressors may put on practicing otolaryngologists in regard to the development of chronic pain and the subsequent impact on productivity, longevity, and quality of life.

Objectives: To determine the proportion of otolaryngologists with work related musculoskeletal discomfort (WRMD) and to review objective ergonomic data that contribute to WRMD. Study Design: Systematic review and meta-analysis. Methods: A comprehensive search of the literature identified 1121 articles for initial review of which nineteen (3563 participants) met criteria for qualitative discussion and eight (2192 participants) met criteria for meta-analysis. Random effects meta-analyses were used to estimate the proportion of otolaryngologists reporting WRMD. Results: The overall proportion (95% confidence intervals) of general otolaryngologists reporting WRMD was 0.78 (0.67, 0.86); 0.52 (0.42, 0.61) for neck symptoms; 0.29 (0.21, 0.39) for shoulder symptoms; and 0.44 (0.35, 0.53) for back symptoms. Qualitative analysis revealed that overall prevalence of WRMD from data restricted to specific subspecialties is lower than non-subspecialty practice with the overall rate of WRMD ranging from 64% for endoscopic sinus surgery to 21% for laryngology. Due to WRMD, 57% of surveyed (785 of 1378) otolaryngologists underwent medical treatment, 43% (113 of 263) believed quality of life was negatively impacted, 6% (74 of 1235) required surgery, 16% (109 of 679) needed significant time away from work, and 2% (11 of 542) stopped operating or retired early. Objective measures of ergonomic posture indicate moderate to severe risk of injury during routine clinic and surgical procedures with none found to be low risk. Conclusions: Ergonomic stressors among otolaryngologists contribute to a high rate of WRMD across all subspecialties with notable impact on productivity, longevity, and quality of life.

2:25 Impact of Ambulatory Surgical Centers on Surgical Resident Education

Adam J. Hatala, Syracuse, NY; Amar Suryadevara, MD, Syracuse, NY; Neal Deot, MD, Syracuse, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact surgical centers have on residency training.

Objectives: An increasing number of surgeries that were previously carried out in an academic hospital setting are now being performed at ambulatory surgical centers (ASCs). The extent to which this trend has affected surgical residency training, specifically in otolaryngology, has not been documented. Our objective is to determine if surgical training is impacted by the integration of ENT residents into ambulatory surgical settings. We hope to better understand the differences in the experience of otolaryngology residents at ASCs versus hospital operating rooms to determine whether this national trend has any significant impact on resident training. Study Design: Cohort study. Methods: 15 ENT surgical residents between PGY 2 and PGY 4 completed self-reported evaluations for various inpatient and outpatient procedures at our institution. The total number of surgical cases, the specific type of procedure, the role of the surgical resident, and the percentage of active operating time in that designated role were analyzed. Results: Preliminary data suggests a trend towards increased resident operating time in the ambulatory setting, with the additional benefit of increased daily case volume. When comparing high volume cases (tonsillectomy/adenectomy, and functional endoscopic sinus surgery), residents report operating more in surgery centers. Conclusions: The implementation of ASCs in resident training programs appears to offer an excellent means for residents to increase their surgical experience. With the increased volume of cases at surgical centers, residents are given more surgical training compared to academic hospital operating rooms alone.

2:30 Q&A

2:35 ***Break/Visit Exhibitors/Visit Posters***

3:00 - 3:50 ALLERGY/LARYNGOLOGY PANEL

The Role of the Otolaryngologist in Managing Chronic Cough

Moderators:

Lesley F. Childs, MD, Dallas, TX
David W. Jang, MD, Durham, NC

Panelists:

Amber U. Luong, MD PhD FACS, Houston, TX
Tanya K. Meyer, MD, Seattle, WA
Murugappan Ramanathan, MD FACS, Bethesda, MD
C. Blake Simpson, MD, Birmingham, AL

3:50 Q&A

Moderators:
Julina Ongkasuwan, MD, Houston, TX
Troy D. Woodard, MD FACS, Cleveland, OH

3:55 The Economic Viability of Routine Preoperative Penicillin Allergy Testing in Preventing Inappropriate Clindamycin Use in Otolaryngological Surgery

Matthew Liu, BS, Austin, TX; Megana Challa, BS, San Antonio, TX; Edward D. McCoul, MD MPH, New Orleans, LA; Philip G. Chen, MD, San Antonio, TX

Educational Objective: Patients mislabeled with a penicillin allergy are often inappropriately given prophylactic clindamycin instead of the usual first generation cephalosporin or aminopenicillin in otolaryngological surgery. As such, otolaryngologists may be unnecessarily causing harm to this patient population, given clindamycin's associated risk of clostridium difficile infections (CDI) and poorer wound healing. Penicillin allergy testing exists to rectify this problem; however, its economic viability as a routine preoperative intervention has not been investigated in patients undergoing otolaryngological surgery. At the conclusion of this presentation, participants should be able to 1) determine when routine preoperative penicillin allergy testing is an economically self-sustainable solution in preventing the inappropriate use of clindamycin; and 2) assess the ability of such testing to achieve this level of economic sustainability.

Objectives: To determine the economic feasibility of routine preoperative penicillin allergy testing in preventing the inappropriate use of prophylactic clindamycin among patients mislabeled with a penicillin allergy prior to otolaryngological surgery. Study Design: Break even analysis. Methods: The average cost of penicillin allergy testing and average cost of a clostridium difficile infection (CDI) were obtained from existing literature. A break even equation using these variables was derived to calculate the absolute risk reduction (ARR) in baseline CDI rate due to clindamycin exposure required for preoperative penicillin allergy testing to be economically self-sustainable. The hypergeometric distribution equation was used to calculate the probability that current penicillin skin testing can achieve this ARR. Results: Preoperative penicillin allergy testing was found to be economically self-sustainable if it could decrease the baseline CDI rate by an ARR of 0.85 percent. The probability of current penicillin skin testing to achieve this ARR depended on the baseline CDI rate and the number of patients to be tested. At a baseline CDI rate >/= 2 percent, the probability of penicillin skin testing to achieve economic sustainability was found to be 100 percent regardless of how much patients were tested. Conclusions: In patients mislabeled with a penicillin allergy, routine preoperative penicillin allergy testing may be an economically self-sustainable option to prevent the inappropriate use of clindamycin during otolaryngological surgery. Otolaryngologists should consider performing more penicillin skin tests in patients with an unconfirmed penicillin allergy.

4:00 The Advanced Endoscopic Scoring System: A Novel Grading System for Clinically Meaningful Stratification of Disease Burden in Chronic Rhinosinusitis

Brandon Kamrava, MD, Miami, FL; Torin Phillips Thielhelm, BS, Miami, FL; Roy R. Casiano, MD, Miami, FL; Corrina Levine, MD MPH, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) explain the clinical utility of the advanced endoscopic scoring; and 2) demonstrate the advanced endoscopic scoring system's quality in patient stratification over previously described endoscopic scoring systems of chronic rhinosinusitis.

Objectives: Compare the correlation of Lund Kennedy (LK) and advanced endoscopic scoring system (AES) to preoperative radiologic disease severity and Sino-Nasal Outcome Test-22 (SNOT 22). Compare the correlation of LK, radiologic disease severity, and AES with short term postoperative change in SNOT-22. Study Design: A retrospective review of prospectively collected data in the electronic medical record. Methods: The AES is a unique endoscopic sinus scoring system which stratifies patients by primary or revision surgery and provides detailed assessment of disease severity strata. Adult patients diagnosed with chronic rhinosinusitis

with and without polyps undergoing primary or revision surgery were included in this study. Spearman correlations were utilized for direct correlation with 95% confidence interval (CI) and regression analysis adjusted for demographics and covariates for correlations greater than 0.35. Results: 311 subjects were included. The AES demonstrated a strong correlation of 0.7 (95% CI 0.5, 0.8) in primary surgery and a correlation of 0.8 (95% CI 0.7, 0.9) in revision surgery as compared to the LK correlation of 0.4 (95% CI 0.3, 0.5). The relationship persisted when adjusted for demographics. The AES demonstrated no correlation with preoperative SNOT-22 score. However, in the subset of subjects with postoperative data (n = 54), the AES moderately correlated with postoperative SNOT-22 scores 0.5 (95% CI 0.1, 0.9). Conclusions: The AES strongly correlates with radiologic disease severity as compared to the LK. Additionally, while there is no correlation with preoperative SNOT-22, the AES may correlate with the postoperative SNOT-22, demonstrating its potential utility in guiding patient expectations on postoperative disease course.

4:05 Barosinusitis Due to Routine Weather Changes: Perpetuating a Myth?
James C. Campbell, MD, Durham, NC; Jaden Jang, Durham, NC; Ralph Abi-Hachem, MD, Durham, NC; Philip G. Chen, MD, San Antonio, TX; David W. Jang, MD, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that barosinusitis from routine weather changes is a myth that is actively perpetuated by some sources on the internet, including the websites of some otolaryngology practices.

Objectives: Fluctuations in barometric pressure from routine weather changes may trigger migraines and other pain conditions, but there is no evidence that they lead to sinus inflammation. We sought to assess whether the concept of routine weather barosinusitis (RWBS) is found on the internet, particularly within medical practice websites. Study Design: Cross-sectional website analysis. Methods: Google searches were performed using the following terms: sinusitis weather, sinus barometric pressure, and weather pressure headache. The first 50 websites were collected for each search term. Each website was analyzed for type, location, and content regarding RWBS. Comparisons were made using Pearson chi squared univariate tests with JMP Pro (Version 16.0, SAS Institute Inc, Cary, NC). Results: Of a total of 125 that were analyzed, 24 were otolaryngology practice websites and 12 were other medical practice websites. 9 of the 24 otolaryngology websites purported the idea of RWBS, all of which offered balloon sinus dilation as a treatment option, while 3 discussed a link between weather related barometric pressure and primary headache disorder such as migraine. Only 2 of the 11 non-otolaryngology websites purported the idea of RWBS, while 8 of the 11 discussed a link between barometric pressure and headache disorder. There was a statistically significant relationship between non-academic practice websites and RWBS. ($p<0.01$). Conclusions: The concept of RWBS is readily found on the internet, mainly within otolaryngology websites, although there is no evidence supporting its existence. This highlights the need for educating otolaryngologists and patients regarding our current understanding of the relationship between barometric pressure and headache disorders.

4:10 Human Tracheal Transplantation: A One Year Followup
Eric Michael Genden, MD MBA, New York, NY; Benjamin Laitman, MD PhD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of tracheal transplantation for the management of extensive airway defects.

Objectives: To review the clinical course, histological findings, cytogenetic characteristics, and immunological features of the allograft one year after performing a human vascularized tracheal transplantation. Study Design: Case report. Methods: One year ago, we performed a 9.5 cm vascularized tracheal transplantation to reconstruct an extensive tracheal airway defect that was not amenable to standard reconstructive techniques. The female patient was immunosuppressed with a regimen of tacrolimus, mycophenolate, and steroids. The donor was male. Endoscopy was performed regularly with narrow band imaging (NBI), endoscopic tracheal biopsies were performed on a regular basis with histology, electron microscopy, and fluorescence in situ hybridization (FISH) cytogenetics to demonstrate mucosal migration and allograft chimerism. Histology and free cell DNA were monitored to assess acute and chronic rejection. Results: One year after tracheal transplantation with standard immunosuppression, the patient has not demonstrated evidence of acute or chronic rejection based on histology and free cell DNA testing. The allograft initially sloughed the ciliated epithelium which clinically manifested as a stasis of secretions for a 2 week period after transplantation. This was followed by a transient reepithelialization of the allograft with recipient derived epithelium and normal mucociliary transport resumed. FISH cytogenetic analysis demonstrated that recipient derived mucosa populated the allograft for 90 days, however after 90 days, the allograft epithelium reverted to donor derived mucosa. Conclusions: Human vascularized tracheal transplantation represents a viable solution for long segment airway defects that are not amenable to standard reconstructive techniques. The allograft undergoes a transient repopulation with recipient derived mucosa resulting in an immunological chimera. The ability to maintain this chimeric state may represent an opportunity to deescalate or even mitigate systemic immunosuppression.

4:15 Efficacy of HPV Vaccine as an Adjuvant Therapy in Recurrent Respiratory Papillomatosis
Anusha Ponduri, BA, Bronx, NY; Monica Azmy, MD, Bronx, NY; Eden Axler, BA, Bronx, NY; Vikas Mehta, MD MPH, Bronx, NY; Mona Gangar, MD, Bronx, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to identify HPV vaccine as an effective

adjuvant therapy in the treatment of RRP.

Objectives: To characterize the efficacy of human papillomavirus (HPV) vaccination as adjuvant therapy in recurrent respiratory papillomatosis. Study Design: Systematic review. Methods: Articles published to April 2021 in PubMed, Embase, Cochrane, Google Scholar, ClinicalTrials.gov, and Web of Science were selected with the assistance of a librarian. Relevant articles were systematically reviewed for content and inclusion/exclusion criteria. All retrieved studies were independently analyzed by two reviewers according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis statement and using predefined criteria for inclusion and exclusion. All retrieved studies (n= 870) were reviewed by title and abstract and qualitatively assessed based on inclusion and exclusion criteria. Demographic data, vaccination status, surgical information, inter-surgical interval and surgical procedures per year were collected. Results: The systematic review included 13 studies, comprising 240 patients. All studies utilized the Gardasil quadrivalent vaccine, and one study (Yiu et al. 2019) utilized both the quadrivalent and Gardasil 9 valent vaccines. 6 studies compared inter-surgical interval prior to and after vaccination, with 4 studies (66.7%) demonstrating a significantly greater inter-surgical interval after vaccination ($P<0.05$). 5 studies compared surgical procedures per year prior to and after vaccination, with 3 studies (60.0%) reporting significantly less procedures after vaccination ($P<0.05$). 2 studies reported on HPV seroconversion, with HPV seropositivity of 100% (n=27) prior to vaccination and 25.9% after vaccination (n=7). Conclusions: Given the unpredictable clinical course, HPV vaccination may be beneficial as an adjuvant treatment in conjunction with surgery in patients with RRP.

4:20 Novel Outcome Measures Analysis Questionnaire for Sensor Lead Function in Upper Airway Stimulation
Mohamad Z. Saltagi, MD, Indianapolis, IN; Kayla Powell, MS, Indianapolis, IN; Stephanie M. Stahl, MD, Indianapolis, IN; Shalini K. Manchanda, MD, Indianapolis, IN; Noah P. Parker, MD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to utilize a standardized questionnaire to analyze five outcome measures for sensor lead function in upper airway stimulation.

Objectives: There are no reported objective or subjective measures to evaluate sensor lead electrode function in upper airway stimulation surgery (INSPIRE). This study describes the development of functional outcome measures for intraoperative sensor electrode function. Study Design: Retrospective cohort study of 100 consecutive patients who underwent UAS placement by the senior author between June 2019 and September 2021. Methods: Waveforms were collected and utilized to develop five outcome measures to standardize analysis of sensor lead function, as follows 1) waveform syncing (the rise of waveforms coincides with blue lines (inhalation) while the fall of waveforms coincides with red lines (exhalation); graded using a Likert scale with 1 (<25%), 2 (25-49%), 3 (50-74%), 4 (75-100%); 2) waveform amplitude (there is continuity of the waveform between inspiratory and expiratory phases; graded using a Likert scale with 1 (<25%), 2 (25-49%), 3 (50-74%), 4 (75-100%); 3) presence or absence of sensory current leakage (yes or no); 4) presence or absence of cardiac artifact; graded using a Likert scale with 1 (none), 2 (< 1/3 of amplitude), 3 (> 1/3 of amplitude), or 4 (unstable/inconsistent); and 5) overall impression (this sensory waveform shows clear detection of inspiration and expiration), graded on a Likert scale as follows: 1 (strongly disagree), 2 (disagree), 3 (agree), 4 (strongly agree). Two sleep surgeons compared all 100 waveforms in a blinded fashion and assigned scores as noted above, and these were then statistically compared. Results: Interrater reliability (interclass correlation coefficient) was greater than 0.8 (excellent) for all comparisons. Conclusions: This study demonstrates a method of sensor electrode outcome measurement that is reproducible for surgeons and sleep medicine specialists looking to evaluate function. Consideration should be given to utilizing this novel tool in the clinical/research setting.

4:25 Q&A

4:30 #MeToo in Otolaryngology Graduate Medical Education
Haley Catherine Sibley, MD, Detroit, MI; Amy M. Williams, PhD, Detroit, MI; Christie L. Morgan, MD, Detroit, MI; Kathleen L. Yaremchuk, MD, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the long history of sexual harassment and gender discrimination in medicine and gain an appreciation for the fact that this issue is still widespread in the field of otolaryngology, with trainees identifying as female being disproportionately affected by sexual harassment.

Objectives: This study sought to better understand the incidence of sexual harassment amongst otolaryngology residents. Study Design: This is a survey based study targeting current otolaryngology residents at US training programs. Methods: From June through August 2018, survey invitations and links to an anonymous survey were sent to otolaryngology residency program directors in the United States and on listservs targeting otolaryngology residents. Questions included demographics (gender, sexual orientation, and postgraduate year), and a variety of questions assessing the occurrence of different forms of sexual harassment in the workplace. Results were then analyzed by calculating overall affirmative responses to each question, then breaking down into percentage of males versus percentage of females responding affirmatively to each question. Results: Both male and female respondents reported experiencing sexual harassment in training, however further analysis demonstrates that trainees identifying as female experienced greater number of instances of sexual harassment, such that the majority of females reported experiencing denigrating jokes about one's gender and subtle sexual comments (74% and 65%, respectively). Female trainees had a higher

affirmative response rate to every question and represented the entirety of respondents reporting uninvited sexual advances and experiencing denigrating comments about one's sexual orientation. Ten participants noted, via free text, settings in which these instances occurred; general surgery and surgical subspecialty rotations were noted most frequently. Conclusions: Prior survey based studies have revealed widespread sexual harassment in medicine, particularly of women, and especially in surgical specialties. This study reveals that, although both male and female otolaryngology trainees experience sexual harassment in training, women are disproportionately affected by sexual harassment.

4:35 History of African Americans in Otolaryngology

Earl Harley, MD, Washington, DC; Jarrett Michael Jackson, BS, Washington, DC; Stephanie Johng, BA MS, Washington, DC

Educational Objective: The objective was to provide a comprehensive historical analysis of African Americans in the field of otolaryngology.

Objectives: In recent years there has been increased attention given to furthering efforts of diversity and inclusion in the medical field. Particularly within otolaryngology, studies have shown that only 2% of otolaryngologists are African American. The history of African Americans in otolaryngology is rooted in the work and success of Dr. W. Harry Barnes, who was the first Black person to specialize in any specialty. With this article, we sought to highlight the history and legacy of African Americans within this field. Study Design: Systematic review and historical analysis. Methods: Through analysis of existing personal and professional records, manuscripts, and historical documents, a systematic review was conducted. Multiple first person interviews were held for enhanced historical context. Lastly, extensive internet searches were utilized. Results: In 1927, Dr. Barnes became officially board certified as an otolaryngologist, the first African American to be certified by any surgical board. Since Dr. Barnes' foundation, Black otolaryngologists increased in number, though in recent years these numbers have stalled in comparison with other surgical specialties. We identified numerous individuals who have made significant contributions to the field. Additionally, we highlighted institutions that historically have contributed to the training efforts of African Americans within otolaryngology. Historically Black colleges and universities like Charles Drew, Morehouse, Meharry, and Howard provided Black physicians with outlets for training during times when no other options were available. They still serve as the primary producers of Black physicians to this day. Conclusions: This study serves as the first comprehensive historical analysis of African American physicians in the field of otolaryngology. Through a greater understanding of their legacy, we can enhance our cultural understanding of the importance of continued efforts in diversity and inclusion.

4:40 COVID-19 and the Otolaryngology Residency Match: Rising Incidence of Home Matches

Jeffrey David Bernstein, MD, San Diego, CA; Matthew N. Harmon, BS, San Diego, CA; Deborah Watson, MD, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the trends and estimate the effects of the COVID-19 pandemic upon the otolaryngology residency match.

Objectives: To quantify the effect of the COVID-19 pandemic upon the 2020-2021 residency match for otolaryngology-head & neck surgery (OHNS). Study Design: Retrospective review. Methods: Residency match outcomes for all applicants to our institution during 2020-2021 were collected from the National Residency Matching Program including medical school of origin and matched program. Matches were categorized as to home program, within region, or out of region, and sorted by US geographic region. Matches from the 2020-2021 cycle were compared to those from 2019-2020, as well as averages and trends from match cycles 2016-2020. Statistical analysis included descriptive statistics and chi square testing. Results: During 2020-2021, there were 436 applicants to our single OHNS program. From 2019-2020 to 2020-2021, the match rate decreased significantly for groups studied, including: all applicants (72.0% (268/372) to 64.7% (282/436); p=0.025); all US MD senior applicants (76.5% (254/332) to 68.9% 262/380); p=0.024); and US MD seniors specifically without a home program (77.5% (31/40) to 56.4% (22/39); p=0.046). The match rate for US MD seniors with a home program did not change significantly (76.4% (223/292) to 70.4% (240/341); p=0.09). From 2019-2020 to 2020-2021, the proportion of US MD seniors who matched to home program increased significantly (22.0% (49/223) to 30.0% (72/240); p=0.05). Conclusions: The COVID-19 pandemic saw high volumes of OHNS applicants with an overall decreased rate of matching compared to previous years. These changes particularly affected applicants without home programs. Home-program matching increased significantly, likely as a consequence of the limitations placed on in-person away experiences including interviews.

4:45 Medicare Utilization and Reimbursement Differences between Rural and Urban Otolaryngologists

Rahul A. Patel, BS, North Haven, CT; Sina J. Torabi, MD, Irvine, CA; Darpan Kayastha, MD, New Haven, CT; R. Peter Manes, MD, New Haven, CT

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the Medicare utilization, billing practices, reimbursement rates, and patient populations of otolaryngology physicians practicing in rural and urban settings as well as social and economic factors that may affect billing practices based on geography.

Objectives: To compare Medicare utilization, billing practices, reimbursement rates, and patient populations of otolaryngology physicians (ORLs) practicing in rural and urban settings. Study Design: Cross-sectional analysis of the 2019 Medicare Provider Utilization and Payment datasets. Methods: Total and mean number of Medicare patients, services, total unique Healthcare Common Procedure Coding System (HCPCS) codes billed, and Medicare reimbursement were gathered along with patient population comorbidity statistics and average hierarchical condition category (HCC) risk scores. Results: In 2019, 92% of 8,959 ORLs practiced in an urban setting. These urban ORLs, on average, billed for 51 (IQR:31-67) unique HCPCS codes, cared for 393 (IQR:172-535) Medicare patients, performed 1761 (502-2070) services, and collected $139,957 (IQR: $55,527-$178,479) per provider. In contrast, rural ORLs, on average, billed for a larger number of unique HCPCS codes (59; IQR: 37-77; $p<0.001$), treated more Medicare patients (445; IQR: 242-614; $p<0.001$), and performed more services (2330; IQR: 694-2748; $p<0.001$), but did not collect more per provider ($141,035; IQR: $56,555-$172,864; $p=0.426$) per provider. The variety and complexity of procedures performed by ORLs was similar in both settings, as was the patient comorbidity profile. ORLs practicing in an urban setting saw, on average, patients with a significantly higher HCC risk score ($p<0.001$). Conclusions: Despite performing procedures of the same variety and complexity, as well as billing for significantly more unique HCPCS codes, Medicare patients, and services per provider, rural ORLs were not reimbursed significantly more per provider when compared to urban ORLs. This may indicate that rural ORLs are reimbursed at decreased levels.

4:50 Q&A

4:55 *Adjourn*

5:30 - 6:00 Meet the Authors Poster Session - Marsalis Hall

SATURDAY, APRIL 30, 2022

7:00 ***Annual Business Meeting (Triological Fellows Only)***

8:00 - 12:00 SCIENTIFIC SESSIONS - LANDMARK B

8:00 **Remarks / Announcements / Introduction of President-Elect**
Ralph B. Metson, MD FACS, Boston, MA by Michael S. Benninger, MD FACS

Moderators:
William R. Ryan, MD FACS, San Francisco, CA
Larry L. Myers, MD FACS, Dallas, TX

8:10 **TRIOLOGICAL SOCIETY 2021 HONORABLE MENTION FOR CLINICAL RESEARCH AWARD**
Impact of Immunosuppression on Cutaneous Head and Neck Squamous Cell Carcinoma
Cecelia E. Schmalbach, MD MSc FACS, Philadelphia, PA

Objectives: This study aims to investigate the impact of immunosuppression on head and neck cutaneous squamous cell carcinoma (HN cSCC). Hypothesis 1: Immunosuppressed HN cSCC patients portend worse outcomes with respect to disease recurrence and survival. Hypothesis 2: The impact of immunosuppression is heterogeneous and based on iatrogenic etiology with solid organ transplant (SOT) portending the worst prognosis compared to hematopoietic/bone marrow transplant (HemeP/BMT) and autoimmune/rheumatology disorders (AI/Rheum). Study Design: Prospective cohort study with planned chart review (2004-2017). Methods: HN cSCC patients queried from a tertiary care medical center data registry were categorized as immunosuppressed (IS) and immunocompetent (IC). Patient demographics, tumor characteristics, and outcomes were compared utilizing univariate analysis. Multivariate regression analysis with best fit modeling was performed for the primary endpoints of: progression free survival (PFS), disease specific survival (DSS) and overall survival (OS). Subgroup analysis was performed based on iatrogenic immunosuppression etiology of SOT, HemeP/BMT and AI/Rheum. Results: 571 cSCCs in 233 patients met inclusion criteria: 146 (62.7%) patients were immunosuppressed (IS); 87 (37.3%) were immunocompetent (IC) controls. IS patients were younger ($p<0.0001$), experienced more numerous cSCC tumors ($p=0.0004$), presented more often with synchronous lesions ($p=0.035$), and were more likely to develop disease in the high risk mask regions ($p=0.041$). Immune status significantly impacted T-stage ($p=0.027$) but did not affect nodal stage, metastatic stage, or overall AJCC staging category. IS patients were more likely to develop recurrence (31.86% vs 11.86%; $p=0.005$) with local disease being the most common site ($p=0.031$). Multivariate analysis identified a statistically significant worse PFS for patients with: advanced AJCC stage category, extranodal extension, perineural invasion, parotid involvement, tumor diameter, ulceration and immunosuppression. Kaplan Meier survival analysis identified a higher rate of recurrence ($p=0.003$) and worse DFS ($p=0.047$) among the IS cohort but no difference in OS. Best fit modeling identified advanced stage, tumor diameter, presentation as recurrent disease and immune status as predictive for worse DFS. Iatrogenic etiology of immunosuppression demonstrated the following distribution: 91 (62.32%) SOT; 25 (16.03%) HemeP/BMT; 30 (20.55%) AI/Rheum. Subgroup analysis identified a significant difference in PFS ($p=0.02$) with SOT patients performing worse. A difference in DFS no longer reached significance at the subgroup level but OS differed ($p=0.0019$) with HemeP/BMT patients experiencing the highest overall mortality. At the subgroup analysis level, advanced stage, tumor diameter, and presentation as recurrent disease remained significant in best fit modelling as did SOT ($p=0.0345$) and HemeP/BMT ($p=0.0358$) but AI/Rheum disorders were no longer predictive of PFS ($p=0.5290$). Conclusions: We identify an association between immunosuppression and poor prognosis for HN cSCC patients. Immunosuppression was identified as a significant predictor portending worse PFS utilizing multivariate analysis of patient characteristics, known tumor risk factors, and immune status. Analysis of organ transplantation, hematopoietic, autoimmune and rheumatologic disorders revealed heterogeneous outcomes based on iatrogenic immunosuppression etiology with SOT portending the worst PFS. Our findings strongly support the need for continuing research and consideration of immune status in future cSCC research and staging systems.

8:20 **Pain and Its Treatment after Transoral Robotic Surgery: A Scoping Review**
Daniel O. Kraft, BA, Providence, RI; Vusala Snyder, MD, Pittsburgh, PA (Presenter); Shaum S. Sridharan, MD, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the existing literature regarding pain following transoral robotic surgery. Participants should also learn that there are significant gaps regarding the time course of postoperative pain, the impact on the healthcare system, and optimal treatment.

Objectives: Pain following transoral robotic surgery (TORS) for oropharyngeal squamous cell carcinoma (OPSCC) is a driver of adverse outcomes, and no consensus exists regarding optimal treatment. This study's objective was to characterize existing literature regarding pain following TORS. Study Design: Scoping review. Methods: Search criteria were developed and used to query OVID Medline, CINAHL, Cochrane, PubMed, and Embase databases. Two team members independently screened titles and abstracts and completed full text reviews. Studies examining TORS for OPSCC with quantitative pain data were included. Conflicts were re-

solved among two team members. Data was extracted using guidelines from Cochrane. The study followed the PRISMA guidelines and was registered with the Open Science Framework. Results: 1467 studies were imported for screening and 624 duplicates were removed. 807 studies were excluded during title and abstract screening. Of the remaining 36 studies, 25 studies were ultimately included. The average study sample size was 89 participants. 68% were conducted in a single center academic setting. Pain was assessed using 13 different metrics (e.g., visual analog scale, UW-QOL). The study intervals ranged from postoperative days 1-15 and up to 2 years following TORS. Studies found that TORS pain is similar to tonsillectomy related pain, peaks several weeks postoperatively, decreases between 1 and 6 months and returns to baseline thereafter. Postoperative pain is a significant cause of hospital readmissions. No clinical trials have demonstrated a significant benefit for NSAIDs or steroids. Conclusions: Studies specifically evaluating pain following TORS are small and heterogeneous. Further prospective studies are needed to characterize TORS associated pain and to develop optimal treatment strategies.

8:25 Impact of Surgeon Specialization on Patient Outcomes following Thyroidectomy

Dhvani R. Shihora, BS, Newark, NJ; David A. Cohen, BA, Newark, NJ; Aatin Dhanda, BA, Newark, NJ; Christopher C. Tseng, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to determine the impact of surgeon specialization (SS) and surgical case volume (SCV) on patient outcomes for thyroidectomy.

Objectives: To investigate outcomes associated with surgeon specialization (SS) and surgical case volume (SCV) for thyroidectomy patients. Study Design: Retrospective database analysis. Methods: The 2003-2009 National Inpatient Sample was queried for thyroidectomy cases. SS was defined as the percentage of cases performed by the surgeon that were thyroidectomies and SCV as the total thyroidectomy cases performed per surgeon per year. Surgeons were further divided into quartiles based on SS and SCV. Univariate and multivariate analyses were performed. Results: 51,360 cases of thyroidectomy were identified. Overall, average SS was 13.8% (range: 0.00%-100.0%) and average SCV was 26.1 cases (range: 1-126). Overall patient mortality (1.0% vs. 0.3%, $p<0.001$) and adverse discharge disposition rates (7.0% vs. 1.6%, $p<0.001$) decreased as SS increased. Similarly, overall patient in-hospital mortality (1.2% vs. 0.2%, $p<0.001$) and adverse disposition rates (6.8% vs. 1.3%, $p<0.001$) decreased as SCV increased. Logistic regression showed decreased odds of in-hospital mortality (OR 0.27, 95% CI: 0.15-0.49, $p<0.001$) and decreased odds of adverse disposition (OR 0.22, 95% CI: 0.18-0.28, $p<0.001$) for the highest SS quartile compared to the lowest. Similarly, decreased odds of in-hospital mortality (OR 0.17, 95% CI: 0.12-0.24, $p<0.001$) and adverse disposition (OR 0.18, 95% CI: 0.16-0.21, $p<0.001$) was demonstrated in the highest SCV quartile compared to the lowest. Conclusions: Increased surgeon specialization for thyroidectomy and case volume were each significantly associated with improved mortality and discharge disposition. On multivariate analysis, each was also significantly associated with lower likelihood of in-hospital mortality and adverse disposition following discharge.

8:30 Survival in Patients with Intermediate Risk Differentiated Thyroid Cancer

Arash Abiri, BS, Irvine, CA; Khodayar Goshtasbi, MD, Irvine, CA; Sina J. Torabi, MD, Irvine, CA; Edward C. Kuan, MD MBA, Irvine, CA; Tjoson Tjoa, MD, Irvine, CA; Yarah M. Haidar, MD, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the survival benefits of different treatment combinations in specific histological variants of intermediate risk differentiated thyroid cancer.

Objectives: To analyze the variant specific survival benefits of employing standardized treatment combinations of surgery (S), radioactive iodine ablation (RAI), and thyroid stimulating hormone suppression therapy (THST) in intermediate risk differentiated thyroid cancer (DTC). Study Design: Retrospective database study. Methods: The 2004-2017 National Cancer Database was queried for patients receiving definitive surgical treatment for intermediate risk papillary (PTC), follicular (FTC), or Hurthle cell (HTC) thyroid cancer. Cox proportional hazards and Kaplan-Meier analyses assessed for treatment associated mortality risk and overall survival (OS), respectively. Results: A total of 65,736 patients were analyzed, with 72.2% females and an average age of 45.4±15.4 years. S+RAI was associated with reduced mortality in PTC (hazard ratio [HR] 0.680; $p<0.001$) and FTC (HR 0.602; $p=0.031$). S+RAI+THST was associated with reduced mortality in PTC (HR 0.628; $p<0.001$), FTC (HR 0.490; $p<0.001$), and HTC (HR 0.520; $p=0.006$). On Kaplan-Meier analysis, S+RAI+THST was associated with greater OS than surgery and S+RAI for all DTC morphologies (all $p<0.05$). Regardless of the presence of lymphovascular invasion, nodal metastasis, or positive surgical margins, S+RAI and S+RAI+THST were associated with improved OS than surgery alone (all $p<0.05$). A survival benefit was not observed with the addition of THST in patients with lymphovascular invasion or N1A tumors. Conclusions: Intermediate risk DTC exhibited varying susceptibilities to different treatment combinations depending on histology, with greatest responses to regimens that included RAI. This tendency extended to DTC cases with particular traits, including lymphovascular invasion, nodal metastasis, and positive surgical margins.

8:35 Do Transferred Adult Patients Undergoing Tracheostomy Have an Increased Likelihood of Postoperative Complications and Outcomes?

Mehdi S. Lemdani, BA, Newark, NJ; Avneet Randhawa, BS, Newark, NJ; Vraj P. Shah, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Christina H. Fang, MD, Bronx, NY; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to consider whether transfer status

impacts postoperative complications in adult patients who receive tracheostomies.

Objectives: Patients transferred in from entry points of care typically have complex comorbidities and complications that require greater management. However, the impact of transfer status has not been examined in adult tracheostomy patients. Our study seeks to determine whether transfer status predicts postoperative outcomes following tracheostomy. Study Design: Retrospective database review. Methods: The National Surgical Quality Improvement Program database was queried for adult patients with known transfer status who underwent tracheostomy between 2005 and 2018. Multivariate analyses were conducted to investigate the association between transfer status and postoperative comorbidities and complications. Results: 4,469 patients were included. The mean age was 60.9 years. 336 patients (7.5%) were transferred in and 70.8% experienced any complication compared to 48.1% of directly admitted patients ($p < 0.001$). Univariate analysis also showed that transferred patients were likelier to experience postoperative superficial surgical site infection (SSI) ($p < 0.001$), pneumonia ($p < 0.001$), extended ventilator dependence (EVD) ($p < 0.001$), acute renal failure ($p < 0.001$), urinary tract infection ($p < 0.001$), cardiac arrest ($p = 0.018$), sepsis ($p < 0.001$), and septic shock ($p < 0.001$). Multivariate analysis controlling for age, race, sex, ASA status, and significant comorbidities and complications associated transfer status with reduced likelihood of SSI (OR 0.237, 95% CI 0.083 - 0.676, $p = 0.007$) and increased likelihood of EVD (OR 1.664, 95% CI 1.157 - 2.395, $p = 0.006$). Conclusions: This study found an association between transfer status and specific complications. Transferred patients undergoing tracheostomy have more complications, though transfer status does not impact postoperative outcomes for mortality.

8:40 The Effects of E-Cigarette Use in the Upper Airway: A Systematic Review

Zainab Farzal, MD MPH, Chapel Hill, NC; Kayla B. Hicks, MD, Chapel Hill, NC; Trevor G. Hackman, MD, Chapel Hill, NC; Wendell G. Yarbrough, MD MMHC, Chapel Hill, NC; Adam J. Kimple, MD PhD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the negative effects of vaping on the upper aerodigestive tract.

Objectives: While the negative effects of electronic cigarettes (e-cigarettes) on the lungs are beginning to be understood, few data reports exist about their deleterious effects on the upper airway. The purpose of this systematic review was to analyze the effects of e-cigarettes on the upper aerodigestive tract. Study Design: Systematic review. Methods: Systematic searches were performed in PubMed, Cochrane, Scopus, and Ovid databases in accordance with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines querying publications from 2003, when the e-cigarette was invented, to October 2021. Basic science and clinical research studying either animal models or humans were included. Results: The literature search retrieved 659 articles of which 29 studies met inclusion criteria and spanned subsites including the nose, oral cavity, oropharynx, larynx, and trachea. A variety of e-cigarette liquids were analyzed, and effects of vaping on the upper aerodigestive tract included hyperplasia/metaplasia, DNA damage, changes in microbiome, and overt accidental injuries. The majority of the studies focused on animal models, with more recent research analyzing harmful effects of e-cigarettes in human tissues. Conclusions: Despite concerning findings, few studies focus on negative health effects of e-cigarettes in the upper aerodigestive tract. As e-cigarettes continue to be popular, particularly among younger generations, this review indicates that otolaryngologists, as the primary caregivers for diseases affecting the upper aerodigestive tract, should expand studies to identify the injurious effects of e-cigarettes in our patient population for appropriate counseling and management.

8:45 Impact of Prolonged Operative Time on Postoperative Complications in Outpatient Adult Tonsillectomies

Rushi Patel, BA, Newark, NJ; Ariel Omiunu, BS, Newark, NJ; Aatin K. Dhanda, BA, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the risk for postoperative complications in patients with prolonged operative times undergoing outpatient tonsillectomy.

Objectives: Prolonged operative times (OT) have been associated with negative outcomes in various surgical fields. We examine the impact of prolonged OT on postoperative complications in patients undergoing tonsillectomy. Study Design: Retrospective database review. Methods: The 2012-2018 National Surgical Quality Improvement Program (NSQIP) database was queried for patients undergoing outpatient tonsillectomy. Patients receiving concurrent procedures or with missing OT data were excluded. Patients with OT greater than 75th percentile were defined to have prolonged OT. We conducted univariate and multivariate analyses. Results: A total of 22,187 patients met inclusion criteria. The majority of patients were female (68.8%) and White (65.4%) with a median age of 26 years. Of these cases, 5,174 (23.3%) cases had prolonged OT with a total of 255 (1.1%) patients experiencing a complication. Patients with prolonged OT were significantly more likely to be obese (39.1% vs. 33.3%, $p<0.001$), have diabetes mellitus (3.3% vs. 2.4%, $p<0.001$), and smoke (17.4% vs. 15.2%, $p<0.001$). Multivariate regression analysis demonstrated a significant association between prolonged OT and all complications (OR=1.49 [1.08-2.05], $p=0.015$), reoperation (OR=1.38 [1.17-1.63], $p<0.001$), and unplanned readmission (OR=1.49 [1.20-1.84], $p<0.001$). Individual complication analysis revealed associations with organ space surgical site infection (OR=3.10 [1.20-8.00], $p=0.020$) and reintubation (OR=3.96 [1.16-13.50], $p=0.028$). Conclusions: Prolonged OT in outpatient adult tonsillectomies is associated with increased complications, reoperation, and unplanned readmission. Future study examining risk factors for prolonged OT may be warranted to prevent such complications.

8:50 Q&A

8:55 - 9:50 GENERAL/CLINICAL FUNDAMENTALS PANEL

Lessons from COVID-19

Moderator:

Jay F. Piccirillo, MD FACS, St. Louis, MO

Panelists:

Aerosolization during Office Procedures
Louise Davies, MD MS, White River Junction, VT

Communicating with Patients
Jennifer J. Shin, MD, Boston, MA

Oncologic Care during a Pandemic
Baran D. Sumer, MD, Dallas, TX

The Role of Telemedicine after the Pandemic
Erika A. Woodson, MD FACS, Cleveland, OH

9:55 Q&A

10:00 *Break/Visit Exhibitors/Visit Posters*

Moderators:
Alisha N. West, MD, Los Angeles, CA
David G. Lott, MD, Phoenix, AZ

10:25 Radiology Administered Protocol for MRI in Patients with Cochlear Implants without Magnet Removal to Enhance Workflow Efficiency and Patient Safety
Brian Jacob Johnson, MD, Rochester, MN; Robert E. Watson, MD PhD, Rochester, MN; Britany J. Wiste, BS, Rochester, MN; John I. Lane, MD, Rochester, MN; Heidi A. Edmonson, PhD, Rochester, MN; Matthew L. Carlson, MD, Rochester, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the development, implementation, and validation of a radiology administered protocol to obtain MRI in patients with cochlear implants, without magnet removal.

Objectives: To describe the development, implementation, and validation of a radiology administered protocol to obtain MRI in patients with cochlear implants, without magnet removal. Study Design: Retrospective review and description of novel care pathway. Methods: At many centers, an otolaryngology provider is required to assist with headwrap placement and post-scan examination, which results in workflow inefficiency for the radiology team and strain on otolaryngology service bandwidth. A radiology administered protocol was designed based on careful input from the neuroradiology safety group and neurotology. Radiology technologist training modules, consent instructions, patient educational material, clinical audits, and other safeguards were implemented. The primary outcomes measured were magnet dislodgement during MRI, and operational efficiency under the new protocol. Results: Since implementation in June 2018, 247 patients have completed one or more MRI studies using the radiology administered protocol. Regular clinical audit shows no reduction in patient safety when compared to a historical institutional cohort who were “wrapped” by an otolaryngology provider [12 (5%) patients experienced magnet tilt or flip]. The protocol has reduced pre- and post-scan delays and eased clinical demands for otolaryngology providers. Conclusions: We present the successful implementation of a standardized radiology administered protocol to streamline care and enhance safety for cochlear implant recipients who require MRI. Resources developed, including a process map, radiology training modules, consent instructions, patient educational materials, clinical audit, and other procedural safety measures are provided so that interested groups may consider adopting similar measures according to need.

10:30 Comparison of Endoscopic Underlay and Over-Under Tympanoplasty Techniques
James Wu Bao, BA, St. Louis, MO; Cameron C. Wick, MD, St. Louis, MO

Educational Objective: At the conclusion of this presentation, participants should understand the technical nuances and potential advantages of endoscopic over-under tympanoplasty for challenging large or anterior tympanic membrane perforations.

Objectives: To compare the indications and efficacy of endoscopic over-under tympanoplasty versus endoscopic underlay tympanoplasty. Study Design: Retrospective chart review. Methods: Patients who underwent a type I endoscopic tympanoplasty via either an underlay or over-under technique by a single surgeon from 2017-2021 were included in this study. Patients were excluded if they had a concurrent mastoidectomy, ossiculoplasty, or advanced cholesteatoma defined by more than two middle ear subsites. Patient demographics, perforation size and location, middle ear status, preoperative and postoperative audiograms, and perforation closure

were reviewed. Middle ear status was scored using the Ossiculoplasty Outcome Parameter Score (OOPS). The main outcome measures were graft take, postoperative pure tone average (PTA) and air bone gap (ABG). Results: Of 56 patients, 33 underwent endoscopic underlay tympanoplasty and 23 underwent endoscopic over-under tympanoplasty. Tragal cartilage perichondrium was used in 91%. OOPS was not significantly different between groups. Over-under technique addressed significantly larger perforations (median size of 50% vs. 30%, p = .002) and a higher rate of anterior extension (96% vs. 24%, p < .001) than underlay technique. Graft success rate was not significantly different between groups, both overall (94.7% vs. 96.3%) and when stratified by perforation size and anterior extension. Patients experienced significant improvement in PTA and ABG in both groups. The only complications included a superficial keratin pearl in each group. Conclusions: The endoscopic over-under tympanoplasty is noninferior to endoscopic underlay tympanoplasty in terms of graft take and audiologic improvement. The over-under technique is effective for repairing larger perforations or those with anterior extension.

10:35 Utility of Preoperative Laboratory Testing among Low Risk Patients in Ambulatory Mastoidectomy Procedures
Sugosh M. Anur, BS, Stratford, NJ; Edward Lai, BSE, Stratford, NJ; Ariel Omiunu, BS, Newark, NJ; Sudeepti Vedula, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the usefulness of preoperative laboratory testing in low risk, outpatient mastoidectomy patients.

Objectives: The objective of this study is to examine the patterns of preoperative laboratory tests (PLTs) in low risk patients undergoing ambulatory mastoidectomy and to assess their effects on postoperative complications. Study Design: Retrospective database study. Methods: The American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database from 2005-2018 was used. Low risk patients were determined to be ASA class 1 or 2. PLTs were separated into chemistry, hematology, coagulation, and liver function tests. Univariate analysis was performed using Pearson chi square and Fisher's exact test. Binary logistic regression was performed to determine the independent effects of covariates on post-surgical complications. Results: 2,357 patients satisfied the inclusion criteria, of which 1,058 patients (44.9%) underwent at least 1 PLT. The most frequent PLT was a complete blood cell count (76.7%). Patients who were 16 to 40 years of age (p<0.001), male (p<0.001), Black (p<0.001), and hypertensive requiring medication (p<0.001) were more likely to receive PLTs. Major complications occurred in 2.2% of patients. There was no significant difference in rates of superficial (p=0.480) or deep (p=0.505) incisional surgical site infection, wound disruption (p=0.332), urinary tract infection (p=0.505), sepsis (p=0.449), return to the operating room (p=0.745), or unplanned readmissions (p=0.496) in patients with or without PLTs. However, on multivariate analysis, patients who underwent coagulation studies had decreased risk of overall postoperative complications (OR 0.116, 95% CI 0.015-0.88, p=0.038). Conclusions: Our study demonstrates that only patients with coagulation studies were at decreased risk of complications following ambulatory mastoidectomy procedures.

10:40 Tai Chi as an Adjunctive Therapy for Individuals Who Plateau after Vestibular Rehabilitation
Kevin Chow, BA, Houston, TX; Laura Lei-Rivera, DPT, New York, NY; Maura K. Cosetti, MD, New York, NY; Jennifer L. Kelly, DPT, New York, NY

Educational Objective: At the conclusion of this presentation, participants should be able to discuss the role of tai chi in improving balance outcomes for individuals who plateau after completion of a full course of vestibular rehabilitation.

Objectives: To evaluate the effectiveness of tai chi on balance function in patients with improved, but persistent dizziness following completion of a traditional vestibular rehabilitation therapy (VRT) program. Study Design: Prospective cohort study. Methods: Patients who completed traditional VRT with persistent symptoms of imbalance were prospectively enrolled in a tai chi program consisting of eight weekly one hour classes. Sessions utilized modified Yang style movements tailored to improve daily function. Therapeutic efficacy was measured prior to the first session and after the eighth using standardized assessments of balance function: the Dynamic Gait Index (DGI), Activities-Specific Balance Confidence Scale (ABC) and the Dizziness Handicap Inventory (DHI). Results: 51 patients were enrolled from 2009 to 2016, of which 37 participants (34 females, 3 males) completed the full program with pre- and post-intervention testing. Mean age was 76.8 (range 56-91 years). Three patients were unable to complete all sessions and eleven were lost to followup on post-testing. Mean DGI increased significantly after completion of the Tai Chi program (p<0.00001, paired t-test). Mean ABC increased from 63.6% to 67.9% on pre/post-testing, but was not statistically significant (p=0.08, paired t-test). A subset (n=18) of patients completed a pre- and post-testing DHI without significant change after therapy (p=0.62, Wilcoxon Signed Rank Test). However, age was negatively and moderately associated with change in DHI (rs=-0.57, p=0.01; Spearman's Rho). Overall, the majority (36/37, 97.3%) of patients demonstrated post-therapy improvement on one or more assessments. Conclusions: Tai chi is a viable adjunct to empirically improve balance in patients who no longer attain benefit from traditional vestibular rehabilitation.

10:45 Layperson Perceptions of Symptoms Caused by the Sinus

Charles A. Riley, MD, Bethesda, MD; Edward D. McCoul, MD MPH, New Orleans, LA (Presenter); Waleed M. Abuzeid, MD, Seattle, WA; Nadeem A. Akbar, MD, New York, NY; Jivianne T. Lee, MD, Los Angeles, CA; John S. Schneider, MD, St. Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to identify differences between patients and providers regarding symptoms caused by the sinuses.

Objectives: The paranasal sinuses make important contributions to general health and quality of life. Yet, patient perceptions of the symptoms caused by the sinuses may vary widely and are subject to ambiguity. We aimed to explore the perceived symptoms caused by the sinuses, as defined by otolaryngology patients and clinicians. Study Design: We performed a multi-institutional, cross-sectional study using a semantics based questionnaire. Methods: Consecutive patients were enrolled at six academic otolaryngology centers from June 2020 until May 2021. The primary outcome examined patient and provider definitions for the symptoms caused by the sinuses from a list of twenty-eight proposed terms covering six general categories. This data was also collected from otolaryngology faculty at the same institutions. Results: Responses were obtained from 378 patients (54% female, mean age 47.4 years) and 28 otolaryngologists (36% female, mean age 37.1 years). Patients selected a median of 12 terms, compared to 7.5 for otolaryngologists. Among patients, the most frequently selected symptom categories were mucus (350, 92.6%), airflow (344, 91.0%), and pain (331, 87.6%). Compared to patients, clinicians selected with lower frequency the symptom categories of mucus (21.2% difference; 95% CI 11.5%-32.1%), airflow (19.6% difference, 95% CI 9.2%-30.4%), and pain (9% difference; 95% CI 0.1%-20.3%) domains. Multiple categories were selected by 98% of patients and 79% of providers. Conclusions: Semantic differences exist between patients and providers regarding the symptoms caused by the sinuses with providers having a narrower set of potential symptoms. These differences may have important implications for communication between otolaryngologists and their patients.

10:50 Palatal Coupling Maneuvers Do not Predict Hypoglossal Nerve Stimulator Treatment Efficacy

Bryan Renslo, BS, Philadelphia, PA; Kealan Hobelmann, MD, Philadelphia, PA; Emily S. Sagalow, BS, Philadelphia, PA; Ashwin Ananth, MD MBA, New Orleans, LA; Maurits S. Boon, MD, Philadelphia, PA; Colin T. Huntley, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to determine if palatal coupling maneuvers during drug induced sleep endoscopy can predict treatment efficacy of the hypoglossal nerve stimulator.

Objectives: For obstructive sleep apnea (OSA), maneuvers during drug induced sleep endoscopy (DISE) have been used as predictors for success with oral appliances. The hypoglossal nerve stimulator (HGNS) promotes opening at the velum through palatoglossus coupling. In this study, we evaluate the use of palatal coupling maneuvers during DISE as predictors for HGNS treatment efficacy. Study Design: Retrospective observational. Methods: Patients underwent HGNS surgery between November, 2014, and February, 2021. Patients received preoperative DISE during which palatal coupling maneuvers including jaw thrust and chin lift were rated on a scale of 1 to 4 at the velum and tongue base (1: no improvement, 2: mild improvement, 3: moderate improvement, 4: significant improvement). Patients were included if they had a sleep study before and after surgery. Patients were grouped by a score of 1-2 (weak response) or 3-4 (strong response). Apnea hypopnea index (AHI) change was calculated based on the difference between preoperative and postoperative sleep study. Results: 171 patients were included. On jaw thrust, there was no significant difference in AHI change between patients with weak or strong response at the velum (n=68 vs. 94, 9.5 vs. 14.2, p=0.15) or tongue base (n=24 vs. 138, 16.6 vs. 11.3, p=0.24). On chin lift, there was no significant difference at the velum (n=82 vs. 26, 13.9 vs. 11.4, p=0.63) or tongue base (n=92 vs. 72, 10.8 vs. 14.6, p=0.24). Conclusions: Palatal coupling maneuvers during DISE were not predictive of treatment success with the HGNS. Our study suggests that findings using these maneuvers should not preclude HGNS candidacy.

10:55 Development of an Otolaryngology Training Program in Uganda

Ryan A. Bartholomew, MD, Boston, MA; John Ceremsak, MD, Nashville, TN; Doreen Nakku, MD, Mbarara, Uganda; Victoria Nyaiteera, MD, Mbarara, Uganda; Eva Senechal, BASc, Montreal, QC Canada; David A. Shaye, MD MPH, Boston, MA

Educational Objective: To describe and analyze the development and evolution of an otolaryngology training program in Uganda in order to identify successful strategies, as well as areas for future improvement.

Objectives: Otolaryngologic pathology is a significant component of disease burden in Africa exacerbated by inadequate numbers of otolaryngologists. The otolaryngology department at a university in Uganda is working to evolve to meet this unaddressed disease burden by having created the country's second otolaryngology residency training program in 2010. Surgical training programs rely on surgical volume of varying case complexity to fulfill resident teaching obligations. We investigated surgical case complexity during an early five year period of the program and interpret it with respect to a timeline of key interventions and events. Study Design: Retrospective review and narrative history. Methods: Otolaryngology procedures between 2012 and 2016 were collected through retrospective review of surgical logs and coded according to whether they met criteria for classification as a "key indicator

procedure" (KIP) per the United States Accreditation Council for Graduate Medical Education (ACGME). This was analyzed and overlayed on a narrative history and timeline of key interventions and educational events constructed through interviews of departmental faculty. Results: During the study period there was not a consistent trend in total procedures per year but the percent of procedures which qualified as KIPs increased from 3% in 2012 (6/175 total procedures) to 29% in 2016 (35/135 total procedures), with otology KIPs increasing the most. Conclusions: Increasing resources and operating time appear to be the factors important for the continued growth of the program while the effect of educational interventions from outside institutions is unclear.

11:00 Q&A

11:05 - 11:55 GENERAL OTOLARYNGOLOGY PANEL

Advancing Efficiency/Reducing Waste in Otolaryngology: Examples from the Front Lines

Moderator:

Jennifer M. Lavin, MD, Chicago, IL

Panelists:

Improving Efficiency of Clinic Flow: Impacting the Patient and Physician Experience
Sandra Y. Lin, MD, Baltimore, MD

Pediatric Tonsillectomy: Improving Efficiency by Modifying Discharge Criteria
Norman R. Friedman, MD, Aurora, CO

Leveraging Real Time Electronic Patient Reported Outcome Measurement Platform to Improve Treatment Related Quality Metrics in Patients with Cancer
Steven S. Chang, MD FACS, Detroit, MI

11:55 Q&A

12:00 *Adjourn*

5:30 - 6:00 Meet the Authors Poster Session - Marsalis Hall

Poster Session

1. Barriers of Artificial Intelligence Implementation in the Diagnosis of Obstructive Sleep Apnea

Hannah Lousie Brennan, BA, St. John's, NL Canada; Simon Kirby, BEng MD FRCSC FRCPC, St. John's, NL Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the barriers involved with the application of artificial intelligence in the setting of obstructive sleep apnea.

Objectives: 1) Identify the limitations in the current diagnostic gold standard for obstructive sleep apnea, polysomnography; 2) recognize the role of artificial intelligence within the diagnosis of obstructive sleep apnea; and 3) distinguish the barriers involved in implementing artificial intelligence in the diagnosis of obstructive sleep apnea. Study Design: Literature review of the evolution of the diagnosis of obstructive sleep apnea, the role of artificial intelligence in the diagnosis of obstructive sleep apnea, and the barriers in artificial intelligence implementation. Methods: Related publications between 1999 and 2020 were reviewed from the PubMed database using different MESH terms, including "artificial intelligence", "artificial neural networks", "obstructive sleep apnea diagnosis", "barriers to artificial intelligence implementation in diagnosis" and "artificial intelligence in medicine". Results: Definitive barriers to the implementation of artificial intelligence in the diagnosis of obstructive sleep apnea were identified in the literature and categorized into different themes including technology, data, regulation, human resources, education, and culture. Conclusions: Artificial intelligence systems offer benefits to the current diagnostic approach for obstructive sleep apnea, by improving accuracy and utilization of resources. The classification of these challenges into different themes highlights how trust in the technology is central. Establishing a knowledge of the barriers involved in this implementation is critical to the effective adoption of this technology both clinically and diagnostically.

2. Telehealth in Otorhinolaryngology: Efficacy as a Triage and Treatment Modality

John Sebastian de Armas, BS, Loma Linda, CA; Ethan Miles, BS, Loma Linda, CA; Kari Roberts, BS, Loma Linda, CA; Chloe Dominguez, BS, Loma Linda, CA; Michael Reimer, BA, Loma Linda, CA; Steve Lee, MD, Loma Linda, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the purpose behind telemedicine as a clinical tool, the efficacy of telemedicine as a screening method in outpatient practice, and how to triage new vs. established patients appropriately between virtual and in-person visits.

Objectives: During the COVID-19 pandemic, telehealth was rapidly adopted as a patient care option. We investigated how telehealth can be used to effectively manage, treat, and triage otorhinolaryngology patients while decreasing the risk of COVID-19 exposure. Study Design: A retrospective chart review of adult otolaryngology telemedicine visits defined as telephone or video encounters at a tertiary care center between April 1, 2020, and July 31, 2021. Methods: Variables gathered included patient demographics, visit subspecialty type, outcome of telehealth visit, type and quantity of followup, rate of cancellations/no shows, and diagnostic/management concordance between visit types. Results: A total of 231 telemedicine visits were identified: 16% resulted in resolution or referral to other specialties with no need for followup, 38% in temporary deferral with scheduled followup, and 38% in expedited in-person followup. Of those asked to visit the clinic, 36% had their diagnosis or management altered by in-person care. Patients whose visits required additional information were more likely to live further away ($p=0.005$). Established patients had a higher likelihood of temporary deferral with scheduled followup ($p<.001$), whereas new patients had a higher likelihood of expedited in-person followup ($p<0.001$). New patients were also more likely to have their diagnosis or management further refined or altered ($p<0.001$). Patients seen for pathologies pertaining to laryngology were more likely to be scheduled for in-office visits post-televisit ($p<0.001$) and receive changes in diagnosis or management after in-person visits ($p<0.001$). Conclusions: Telehealth effectively triages otolaryngology patients by delineating those who require in-clinic examination versus deferrals, further reducing risk of COVID-19 transmission.

3. Impact of Distance Traveled to High Volume Facility on Outcomes for Non-Squamous Cell Carcinoma Sinonasal Malignancies

Christopher James Didzbalis, BA, Newark, NJ; Rushi Patel, BA, Newark, NJ; Christopher C. Tseng, BS, Newark, NJ; Prayag S. Patel, MD, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand associations between clinical and demographic variables and distance traveled to a high volume facility, as well as its impact on outcomes.

Objectives: While traveling longer distance to a high volume facility has led to improved outcomes compared to traveling shorter distance to a low volume facility for certain cancers, a similar association between distance traveled and facility volume has yet to be elucidated for non-squamous cell carcinoma sinonasal malignancies (NSCCSM). Study Design: Retrospective database analysis. Methods: The National Cancer Database was utilized to obtain data about NSCCSM cases between 2008-2016. Short distance low volume facilities (SDLVF) were defined as < 33rd percentile for distance traveled and NSCCSM case volume, whereas long distance high volume facilities (LDHVF) were defined as > 67th percentile. Univariate and multivariate analyses were performed. Results: Among 1,137 NSCCSM patients, 897 were treated at SDLVF and 240 were treated at LDHVF. Upon performing multivariate logistic regression, patients of a race other than White or Black (OR: 3.312, 95% CI: 1.708-5.744, $p < 0.001$), who had clinical N stage 2 tu-

mor (OR: 2.221, 95% CI: 1.063-4.640, p=0.034), or received a combination of chemotherapy, radiation and surgery (OR:1.571, 95% CI: 1.021-2.254, p=0.039) had higher odds of being treated at a LDHVF. Patients treated at a community cancer center had lower likelihood of being treated at a LDHVF (OR: 0.048, 95% CI: 0.021-0.199, p < 0.001). There was no significant difference in overall survival between the two groups on Kaplan-Meier analysis (log rank p=0.845). Conclusions: While patient race, clinical N stage, treatment modality, and facility type had a significant effect on treatment at a SDLVF compared to LDHVF for NSCCSM, traveling greater distances to receive treatment at high volume facilities did not confer a significant survival benefit.

4. A Computational Modeling Study to Assess the Development of Exercise Induced Rhinitis

Raluca Elena Gosman, BS, Durham, NC; Sarah M. Russel, MD, Chapel Hill, NC; Dennis Onyeka Frank-Ito, PhD, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to describe how increasing airflow rates affects related variables in the nasal vestibule.

Objectives: Exercise induced (EI) rhinitis is a relatively common yet poorly understood phenomenon that can have a significant impact on athletic performance. Characterization of the development of rhinitis during or after exercise is important to better understand triggers and contributing factors. This study aims to characterize how different variations in nasal morphologies respond to airflow related variables during resting and rapid/deep inspiratory conditions. Study Design: Computational fluid dynamics (CFD) study. Methods: Radiographic images from five healthy subjects were used to reconstruct subject specific nasal airways. Each subject's unilateral nasal vestibule morphology was classified as standard, notched, or elongated phenotype. CFD airflow and heat transfer simulations were performed at airflow rates of 10L/min, 15L/min, 20L/min, 30L/min, 40L/min, and 50L/min. Results: For all simulated flow rates, average resistance at the nasal vestibule was highest in notched (0.0723Pa.s/ml at 10L/min to 0.2859Pa.s/ml at 50L/min), followed by standard (10L/min=0.0347Pa.s/ml to 50L/min=0.1456Pa.s/ml). Similar patterns were observed for airflow velocity and wall shear stress. On the contrary, average mucosal heat flux was highest in standard (10L/min=349.21W/m2 to 50L/min=1082. 32W/m2), followed by elongated. Notched phenotypes showed lower mean percent increases from 10L/min to 50L/min in all computed variables at the nasal vestibule when compared with standard and elongated phenotypes. Conclusions: Resistance values and airflow velocities depicted a more constricted nasal vestibule in the notched phenotypes, while perception of nasal mucosal cooling (heat flux) favored the standard phenotypes. Different nasal phenotypes may predispose to EI rhinitis as notched phenotypes consistently had lower percent increases in computed airflow related values.

5. Natural History of Pediatric Chronic Rhinosinusitis after Surgical Treatment: A Cross-Sectional Study

Garrett H. Jones, MD, Morgantown, WV; Maximilian Bonnici, BS, Morgantown, WV; Hassan Ramadan, MD, Morgantown, WV; Chadi Makary, MD, Morgantown, WV

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the natural history of pediatric chronic rhinosinusitis after surgical treatment.

Objectives: To study the natural history of pediatric chronic rhinosinusitis (CRS) after surgical treatment. Study Design: Assess the long term outcomes of patients who were treated surgically for CRS as children more than 10 years ago. Methods: Cross-sectional survey of patients who were treated surgically for CRS as children more than 10 years ago. Survey included SNOT-22 questionnaire, additional endoscopic sinus surgery (ESS) since last treatment, status of allergic rhinitis and asthma, and availability of any CT scan sinus/face for review. Results: 332 patients were contacted by phone. 72 patients filled the survey (21.7% response rate). Current age was 24.9 years (+/-4.7, 14-36.7). Age at initial treatment was 6.7 (+/-3.1, 1.8-14.7). Followup since surgical treatment was 18.2 years (+/-4.2, 10.9-27.4). 51 patients (70.8%) had ESS and adenoidectomy and 21 patients (29.2%) had adenoidectomy only. SNOT-22 score was 34.7 (+/-22.3, 0-83). None of the patients had any additional ESS for the duration of the followup, and only 3 patients had septoplasty and inferior turbinoplasty as adults. 24 patients had CT scan sinuses/face available for review. Scans were obtained at an average of 14 years after surgical intervention (+/-5.2, 6.5-25.5). CT LM score was 0.9 (+/-1.9, 0-6), compared to 8.6 at time of their surgery (+/-5.1, 0-20) (p<0.0001). Currently, 46.5% and 36.1% of patients have asthma and allergic rhinitis, compared to 36.9% and 40.7% respectively as kids (p=0.897 and p=0.613). Conclusions: Children who had surgery for CRS do not seem to have CRS as adults. However, patients continue to have active allergic rhinitis that may affect their quality of life.

6. Deferment from Surgical Treatment due to Risk Factors in Laryngeal Cancers

Nikhit Kethidi, BA, Newark, NJ; Mohammad A. Hossain, BS, Newark, NJ; Sudeepti Vedula, BS, Newark, NJ; Richard Chan Park, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to identify different demographic, clinical, and surgical factors that may defer a patient from surgical therapy.

Objectives: Surgery on laryngeal cancers may not be performed by providers due to various patient risk factors. Our study aims to evaluate demographic, clinical, and surgical differences between patients with laryngeal cancer who received surgery and those who did not due to risk factors. Study Design: Retrospective database study. Methods: The 2004-2016 National Cancer Database

(NCDB) was queried for all cases of invasive laryngeal cancer in patients age 18 years or older. Patients were subdivided into two cohorts: those who received surgery and those who did not receive surgery due to risk factors as determined by their surgical providers. Providers did not report which patient risk factors prevented surgical intervention. Univariate and multivariate analyses were conducted to assess demographic, clinical, and surgical differences. Results: Of 87,000 patients, 3,869 (4.45%) did not receive surgery due to risk factors. On univariate analysis, there were significant differences in sex, age, race, median household income, insurance status, comorbidities, facility type, clinical T stage, other malignancies, and distant metastasis ($p < 0.001$). On multivariate analysis, female sex (OR [95% CI] = 1.191 [1.102-1.288], $p<0.001$), age 60-69 years (5.151 [3.050-8.699], $p<0.001$), African American race (1.334 [1.215-1.464], $p<0.001$), government funded insurance (1.595 [1.46-1.742], $p<0.001$), and uninsured status (1.615 [1.367-1.907], $p<0.001$) were associated with higher rate of deferment from surgery. Conclusions: When compared to those receiving surgery, patients deferred from surgery for laryngeal cancer due to risk factors have demographic as well as clinical and surgical differences. This may warrant a formalized decision making process when determining surgical candidacy.

7. Differences in Survival in Patients with Single Site Metastatic Head and Neck Cancer

Nikhit Kethidi, BA, Newark, NJ; Mohammad A. Hossain, BS, Newark, NJ; Sudeepti Vedula, BS, Newark, NJ; Richard Chan Park, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to identify differences in survival by the site of metastasis in patients with single site metastatic head and neck squamous cell carcinoma.

Objectives: Distant metastasis of head and neck cancers is an important prognostic factor. The location and number of organ systems involved may have clinical implications. Our study aims to evaluate differences in survival of patients with single site distant metastases of head and neck squamous cell carcinoma (HNSCC). Study Design: Retrospective database study. Methods: The 2010-2015 National Cancer Database (NCDB) was queried for cases of invasive head and neck cancer with squamous cell histology in patients age 18 years or older. Patients with distant metastasis to a single organ system were identified, including bone, lung, brain, and liver. Metastasis site was assessed for impact on survival via Kaplan Meier and Cox regression analyses after correcting for relevant demographic, clinical, and surgical factors. Results: Of 5971 patients with single site metastasis, 3961 had lung, 1372 had bone, 534 had liver, and 104 had brain metastasis. One year survival and mean survival time varied by site: bone (38.5%; 18.9 months), lung (45.9%; 20.7 months), brain (31.5% 17.4 months), and liver (42.0%, 18.6 months), $p < 0.001$. On Cox regression analysis, patients with lung metastasis had improved survival when compared to bone metastasis (HR [95% CI] = 0.833 [0.777-0.892], $p < 0.001$). Patients with brain (1.104 [0.877-1.390], $p = 0.398$) or liver (1.011 [0.903-1.132], $p = 0.850$) metastasis did not experience significant differences in survival when compared to bone metastasis. Conclusions: The site of single metastasis for HNSCC may impact survival. Lung metastasis is associated with improved survival when compared to metastasis to bone, liver, or brain.

8. Feasibility of an Otolaryngology Telehealth Clinic at an Urban Safety Net Hospital: A Retrospective Review

Eric K. Kim, BA, San Francisco, CA; Joseph Kidane, BS, San Francisco, CA; Shauna Brodie, RN MS FNP, San Francisco, CA; Delphine Tuot, MD, San Francisco, CA; Jeffrey D. Sharon, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to assess the viability and utility of a rapidly implemented telehealth clinic in otolaryngology.

Objectives: To critically evaluate our experience with an otolaryngology telehealth clinic at an urban safety net hospital after an institution mandated transition to telehealth during the COVID-19 pandemic. Study Design: Retrospective chart review. Methods: Retrospective chart review of all otolaryngology telephone visits in 2020. Data were collected on patient demographics, visit characteristics, and visit outcomes. Univariate regression analysis was utilized to assess whether language, income, or race impacted telehealth utilization and outcomes. Results: We identified 318 total telehealth encounters in a cohort of 254 patients, of whom 46% were female identifying and had an overall median age of 53 years. The clinic served a diverse and socioeconomically disadvantaged population: 74% were of racial/ethnic minority; 76% had low income, need based insurances; 37% required a language interpreter. 23% of telehealth visits were initial presentations for a new chief complaint. Race, insurance status, primary language, or interpreter usage were not associated with whether a patient had a telehealth initial visit versus an in-person initial visit. 83% of telehealth visits resulted in the diagnosis of a condition, medication change, counseling, lab/imaging review, and/or referral placement. 32% of telehealth visits for a new chief complaint did not necessitate further followup. Conclusions: Telehealth in otolaryngology is a feasible and an effective modality for advancing care for patients from low income communities, language discordance, and marginalized backgrounds, who traditionally face barriers in accessing healthcare.

9. Healthcare Disparity Impact on Ordering Polysomnography in a High Risk OSA Population

Devesh Kumar, BS, Milwaukee, WI; B. Tucker Woodson, MD, Milwaukee, WI; David R. Friedland, MD PhD, Milwaukee, WI; Jazzmyne A. Adams, MPH, Milwaukee, WI; Ling Tong, MS, Milwaukee, WI; Jake Luo, PhD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize factors impacting sleep study followup for high risk OSA patients and how to better change and implement institutional guidelines to address this dilemma.

Objectives: To assess demographic and disparity factors associated with ordering polysomnography (PSG) in a high risk high morbidity population. Study Design: Retrospective review. Methods: An OSA screening questionnaire STOP-BANG database of over 300,000 patients was filtered for acute severe cardiac diagnosis (myocardial infarction, atrial fibrillation/flutter, systolic heart failure) between 2015-2020. 4735 patients were risk stratified by STOP-BANG score and the relationship between obtaining a post-admission PSG was correlated to demographic and clinical variables including race, ethnicity, insurance, age, sex, and admitting diagnosis. Multiple statistical tests were used with a $p<0.05$ as the significance cut off. Results: A high risk STOP-BANG score of 5-8 was found in 25.3% of the cohort with sleep studies ordered in only 21.3% of the high risk group. Increasing age and female sex were negatively associated with referrals for a sleep study ($p<0.001$). Race, ethnicity, and insurance status did not correlate with sleep study referrals. Admitting cardiac diagnosis played a significant role in whether a sleep study was ordered ($p<0.001$). Conclusions: In an acute cardiac population with significant OSA associated morbidity, data observed a low percentage of sleep study referrals in all high risk patient groups. Sleep study referrals were negatively affected by age and gender but contrary to our hypothesis were not affected by race, ethnicity, and insurance status. The data from this study suggests that in a high risk cardiac population, sleep studies are significantly under-referred. This could have a significant impact on long term health outcomes.

10. The World's Consumption of a Free Web Based Otolaryngology-Head and Neck Surgery Educational Resource: A Comparison between High and Middle/Low Income Countries

Amelia Sherron Lawrence, BS, Spokane, WA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand what extent is free open access medical education in otolaryngology being used globally.

Objectives: To explore global consumption of a free open access medical education platform for otolaryngology. Specifically, to determine the location, subspecialty content, and what type of information about otolaryngology is being consumed globally. Study Design: Systematic review of the literature and descriptive report of worldly consumption of material overtime using web based analytics from a single free open access medical education platform in otolaryngology. Methods: Systematic review was performed in routine, previously described PRISMA methods. Web based analytics were extracted to determine the location, frequency, education type (surgical video, podcast, or other) and subspecialty content that was consumed. Comparisons were made between high and low/middle income country consumption. Results: Our systematic review reveals that no other analysis of this open access education platform has been performed and is the first to compare otolaryngology consumption between the World Bank country classifications. Analytics reveal a surprising amount of low and middle income country consumption and a pervasive consumption across most continents which is increasing over time. Conclusions: As the world becomes increasingly interconnected, free web based educational platforms will become more important to the core learning style of newer generation otolaryngologists.

11. Nasal Myiasis: An Appropriate Use for Ivermectin

Tate Naylor, MD, Memphis, TN; Robert Yawn, MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, participants should be able to identify the presentation and treatment of nasal myiasis.

Objectives: Myiasis of the head and neck is characterized by infestation of fly larvae in the cavities of the ear, nose, mouth, or tracheotomy stoma. The most common site of infestation is the nasal cavity. While seen sporadically in developing countries with tropical climates, it is a rare condition to be found in developed countries. Treatment of this condition is variable and there is no true consensus on management of nasal myiasis because previous studies are limited to case reports. This study is the first case series in the Western literature to document the presentation and management of consecutive patients with nasal myasis. Study Design: Retrospective case series. Methods: IRB approval was obtained before chart evaluation. All cases of nasal myiasis were evaluated from a single institution over a one year span. Each patient underwent initial debridement followed by treatment with systemic and topical irrigations of ivermectin for seven days. Clinical features including hospital course, demographic information, and long term followup were analyzed. Results: Five patients were identified to have nasal myiasis over a one year span. The average age was 46.4 years (range, 27-64y) and 60% were male. The average time from hospitalization to infection was 4.4 days (range 3-7d), 60% presented with major abdominal trauma, 60% presented with major intracranial trauma, and all patients were sedated and on mechanical ventilation at diagnosis. On average there were no documented external larvae after 2 days of therapy, and all were completely clear after 7 days of therapy. No patients in this series were found to have persistent infection or adverse effects of their therapy at last clinical followup. Conclusions: This serves as the only known case series of nasal myiasis in Western literature and provides a treatment regimen that has been both safe and effective in practice thus far.

12. An Open Access Database for Otolaryngology Humanitarian Missions

Nigel K. Wang, BS, Philadelphia, PA; Punam Patel, MD, Philadelphia, PA; Glenn Isaacson, MD FACS FAAP, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be familiar with how our open access database can serve the needs of humanitarian medical trips for robust electronic medical record keeping.

Objectives: Humanitarian medical trips are often criticized for inadequate medical record keeping. Paper records commonly used on missions lack portability and can be lost, compromising followup care and limiting outcomes research. A laptop based computer system would address these issues. Ideally, the system should document patient encounters, upload images, produce daily operative lists and identify patients needing followup. It should allow easy exchange of data without reliance on the internet, be robust enough to tolerate rough transport and power surges - and it should not require expert IT support. Study Design: N/A. Methods: We have created such a laptop based system using the widely available Microsoft Access database. A private non-internet Wi-Fi network was set up. Multiple Windows laptops were interconnected by creating shared folders on each computer, distributing and "splitting" copies for stability, and then enabling allowed sharing permissions over the Wi-Fi network. The databases were then interlinked allowing each database to access data from all the other databases over Wi-Fi. Results: The result is a robust system that does not rely on any single computer. Wi-Fi access allows quick aggregation of data without requiring external storage devices. Queries help quickly organize the aggregated data, and forms can be customized for different missions. Conclusions: Microsoft Access can be used to create a low cost system for tracking and organizing patient encounters and creating the daily lists needed while conducting an international mission. We intend to offer this system free of charge to humanitarian otolaryngology groups from a central internet source including configured files, an equipment list, and easy setup instructions.

13. Impact of Hypoglossal Nerve Stimulator Implantation on Daytime Functioning in Older Adults with Obstructive Sleep Apnea

Emma G. West, MD, Richmond, VA; Joseph M. Dzierzewski, PhD, Richmond, VA; Elliotnell Perez, MA, Richmond, VA; Pablo Soto, MS, Richmond, VA; Graham Pingree, BS, Richmond, VA; Ryan Nord, MD, Richmond, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify which aspects of daytime functioning are most impacted by hypoglossal nerve stimulator implantation in older adults.

Objectives: Obstructive sleep apnea (OSA) is a common sleep disorder affecting increasing numbers of adults with serious medical consequences if left untreated. Hypoglossal nerve stimulation (HNS) is an option for surgical management in patients meeting certain criteria. This study sought to examine how daytime functioning indices changed following HNS implantation. Study Design: Longitudinal study based on results from self-reported questionnaires. Methods: Questionnaires were administered pre/postoperatively to patients 50 and older undergoing HNS implantation. Questionnaires included NIH PROMIS measures assessing daytime functioning along with Insomnia Severity Index. Demographic information was extracted from medical records. Dependent samples t-tests were used to examine change in impairment and functioning pre- and post-HNS implantation. Results: 32 patients underwent HNS implantation and completed pre/postoperative questionnaires. Patients were generally White and male. Patients showed significantly large improvement in insomnia symptoms and sleep related impairment. Significant moderate improvement was found for cognitive abilities and depressive symptoms. There was small to moderate improvement in anxiety symptoms and anger. There was no significant change in physical function, loneliness, or participation in social roles/activities. Conclusions: This study aimed to examine potential change in daytime functioning associated with HNS implantation in older adults with OSA. As our preliminary data indicates that treatment of OSA via HNS implantation improves self-reported daytime functioning across a wide swath of domains in older adults, we can infer that this method of therapy may reduce risk of negative outcomes associated with OSA in late life, including future neurocognitive decline. Additional studies are needed to further investigate the relationship between HNS implantation and daytime functioning.

14. Longitudinal Analysis of Hypoglossal Nerve Stimulation Therapy Up-Titration Using Cloud Based Usage Data

Yi Cai, MD, San Francisco, CA; James Zheng, BA, San Francisco, CA; Jolie Chang, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe anticipated changes in hypoglossal nerve stimulator settings during therapy titration.

Objectives: To characterize hypoglossal nerve stimulator (HGNS) settings during therapy up-titration using cloud based usage data. Study Design: Case series. Methods: We analyzed HGNS therapy amplitude (in volts, V) and use patterns with data from Inspire Cloud. The endpoint amplitude was defined by the stable and consistent voltage level achieved during self up-titration when the patient underwent post-implant sleep study. Monthly averages for the first 120 days after device activation were evaluated. Patients with complete data (n=27) were included. Results: Average therapy amplitude increased significantly each month between the first (1.14 +/- 0.35 V), second (1.50 +/- 0.48 V), third (1.67 +/- 0.46 V), to fourth month (1.79 +/- 0.55 V) ($p < .00001$). Patients titrated through a greater number of unique therapy voltage levels during month 1 (6.2 levels) than during month 2 (3.6 levels, $p < .001$), month 3 (3.1 levels, $p < .0001$), and month 4 (2.6 levels, $p < .0001$). By the end of month 4, 81% of patients had reached an amplitude within 0.1 V of endpoint amplitude, representing up-titration through an average of 10.7 +/- 3.8 levels (range: 3-18) from baseline (1 level = 0.1V). Average nightly treatment duration decreased monthly between months 1 (6.6 +/- 1.4 hours) to month 4 (5.2 +/- 1.9 hours). Average therapy pause durations did not differ across the first 4 months ($p = .066$). Conclusions: During the first 4 months after HGNS activation, therapy amplitude increased while duration decreased. By the end of month 4, 81% of patients self-titrated their HGNS therapy to a stable nightly therapy amplitude.

15. Can the Otolaryngologist Advocate for the Human Papillomavirus Vaccine?

Sai D. Challapalli, MD, Houston, TX; Lucy X. Liu, BS, Houston, TX; Julie A. Neil, BS, Houston, TX; David Z. Allen, MD, Houston, TX; Ibrahim Alava, MD, Houston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the setup of our pilot HPV vaccine program in an otolaryngology clinic and see the effectiveness of this initiative.

Objectives: To highlight a human papillomavirus (HPV) vaccine initiative at an otolaryngology-head and neck surgery (ENT) clinic in an academic, safety net health system. Study Design: Prospective cohort study. Methods: Patients from 18 to 45 years of age with no history of HPV or head and neck cancer (HNC) were recruited from the ENT clinic. Participants answered a 13 question survey on demographics, knowledge of HPV, HPV associated cancers, and the vaccine. An educational presentation on HPV from the Center for Disease Control was provided. Interested participants were given the first dose of the HPV vaccine. Results: Of the 114 survey respondents, 60% have heard of HPV. 43% associated HPV with cervical cancer but only 21% associated HPV with oral cancer. 55% have never heard of the HPV vaccine, and 86% reported never receiving recommendations for the vaccine. 23% of participants elected to receive the first dose of the vaccine in clinic and 41% completed at least the 2nd dose. 59% of the respondents deferred to another time or wanted to talk to a primary care physician. 4% were interested but just received COVID-19 vaccination within the past two weeks. Conclusions: There is a clear knowledge gap of HPV, its connection to HNC, and the vaccine. Despite participating in this study during the COVID pandemic, patients were receptive to the HPV vaccine. Physician led education and recommendation of vaccination did improve vaccination acceptance in this sample. The otolaryngologist's recommendation for the vaccine demonstrates promising results and can be implemented in ENT clinic.

16. Association between Delay in Surgery and Postoperative Complications and Outcomes in Patients Undergoing Facial Fracture Repair

Mehdi S. Lemdani, BA, Newark, NJ; Hannaan S. Choudhry, BA, Newark, NJ; Christopher C. Tseng, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Christina H. Fang, MD, Bronx, NY; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to consider the importance of minimizing delay in surgery from admission to operation for facial fracture repair.

Objectives: Delay in surgery following admission has been shown to increase postoperative length of stay (LOS) for patients, though its impact has not been studied on facial fracture repair (FFR) outcomes. Study Design: Retrospective database review. Methods: The National Surgical Quality Improvement Program database was queried for patients who underwent FFR between 2010 and 2018. Multivariate analyses were conducted to investigate the association between delay to surgery and postoperative complications, LOS, and outcome. Delay in surgery was defined as any time greater than zero days between admission to operation. Results: 4,856 patients were included. The mean age was 38.90 years. The majority of patients were White (50.7%), male (76.7%), and non-obese (80.4%), though patients were disproportionately Black (20.3%) to the United States general population. The mean time from hospital admission to surgery was 0.35 [1.86] days. Multivariate analysis controlling for age, race, sex, comorbidities, ASA status, CPT code, hypertension, diabetes mellitus, chronic obstructive pulmonary disorder, pneumonia, congestive heart failure, and dependent functional status showed that delay to surgery was a predictor of adverse discharge (OR 3.115, 95% CI 2.289 - 4.239, $p < 0.001$) and postoperative LOS, which increased by 1.280 days (95% CI 1.059 - 1.500, $p = 0.011$). Conclusions: This study found that delays in time to surgery following admission is associated with adverse discharged outcomes and increased LOS but no association was found with other complications. Minimizing time to surgery after admission can help prevent adverse patient outcomes and help with better hospital and healthcare resource allocation.

17. Surgeon Posture during Otolaryngology Procedures and Impact of a Commercially Available Posture Training Device

Karen Lynn Leung, BS, La Jolla, CA; Rachel Segal, BS, La Jolla, CA; Jeffrey Bernstein, MD, La Jolla, CA; Ryan Orosco, MD, La Jolla, CA; Christopher Reid, MD, La Jolla, CA

Educational Objective: The minimal workspace of the head and neck region often puts otolaryngologists in sustained static and awkward postures that may contribute to the high prevalence of work related musculoskeletal disorders among this group of physicians. At the conclusion of this presentation, participants should be able to identify individual and surgery factors that contribute to poor cervical and thoracic spine posture while operating and consider biofeedback in improving posture.

Objectives: To identify factors influencing cervical thoracic spine posture in otolaryngology surgeries and evaluate the efficacy of a commercially available posture training device to improve surgeon posture. Study Design: Prospective cohort study. Methods: 18 subjects wore the UpRight Go 2 posture training device during otolaryngology surgeries classified by procedure subtype (head and neck, rhinology, laryngology, otology/neurotology) and surgical approach (open, endoscopic, microsurgical, robotic). The device initially recorded neck and spine positioning at baseline and later delivered biofeedback to prompt posture correction if sustained poor posture was sensed. ANOVA was used to determine the effects of various individual and surgery characteristics. Student's t-tests compared the proportion of time spent upright before and after the introduction of biofeedback. Results: The proportion of

time spent upright during surgery was significantly different between procedure subtype and surgical approach (both p<.001), with worst performance in head and neck surgeries (62%). Female gender, shorter stature, and use of sitting stools were associated with greater proportion of surgery spent upright (p<0.05). Loupes use was associated with less time in upright posture (p<0.05). With biofeedback intervention, 8 of 10 subjects demonstrated 1-10% improvement in operating upright, although only one of these improvements was statistically significant (p<0.05). Conclusions: This study demonstrates variability in surgeon posture across otolaryngology surgeries and suggests that posture may be improved with sitting and minimizing use of loupes. Additionally, biofeedback is a potential intervention that may help improve posture and should be further evaluated especially among those who have sustained poor posture while operating.

18. Layperson Perception of Migraine Related Symptoms

Charles A. Riley, MD, Bethesda, MD; Waleed M. Abuzeid, MD, Seattle, WA; Nadeem A. Akbar, MD, New York, NY; Ian M. Humphreys, DO, Seattle, WA; John S. Schneider, MD, St. Louis, MO; Edward D. McCoul, MD MPH, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify patient and provider differences of migraine related symptoms.

Objectives: Patients commonly present to an otolaryngology clinic with migraine. Yet, the intended meaning of the term “migraine” is nebulous. We aimed to assess semantic differences regarding the definition of migraine among otolaryngology patients and otolaryngologists. Study Design: We performed a multi-institutional, cross-sectional study using a semantics based questionnaire. Consecutive patients were enrolled at six academic otolaryngology centers from June 2020 until May 2021. Methods: The primary outcome examined patient and clinician definitions for migraines from a list of twenty-eight proposed terms covering six general categories. Secondary outcomes investigated geographic, education, and other demographic variables. This data was also collected from otolaryngology faculty. Results: Responses were obtained from 339 patients (54% female, mean age 47.6 years) and 10 otolaryngologists (60% female, mean age 39.6 years). Patients selected a median of nine terms, compared to 14 for otolaryngologists. Among patients the most frequently selected symptom categories were headache (320, 94.4%), ocular/vision (301, 88.8%), and facial (287, 84.7%) domains. The sinonasal symptom category was the least frequently selected (48, 14.2%). Compared to patients, clinicians selected with greater frequency the symptoms categories of headache (5.6% difference; 95% CI 1.1%-12.5%) and ocular/vision (11.2% difference; 95% CI 5.0%-18.6%) domains. Patients selected the facial (4.7% difference; 95% CI -5.6%-15.5%) domain more frequently. Multiple categories were selected by 98% of patients and 100% of providers. Conclusions: The definition of “migraine” is variable for patients and otolaryngologists, though headache, ocular/vision, and facial symptoms are commonly used. These semantic differences may create an additional barrier to effective patient clinician communication.

19. Factors Related to Wellness and Burnout in Academic Otolaryngology - Head and Neck Surgery: A Pre- and Post-COVID-19 Pandemic Analysis

Lekha V. Yesantharao, BS, Baltimore, MD; Eric X. Wei, MD, Baltimore, MD; Sandra Y. Lin, MD, Baltimore, MD; Yuri Agrawal, MD MPH, Baltimore, MD; Deepa Galaiya, MD, Baltimore, MD

Educational Objective: Physician burnout is a critical problem in our current healthcare system. With the onset of the COVID-19 pandemic in early 2020, physicians are facing unprecedented stressors that could exacerbate already high burnout levels. From this study, attendees will understand the factors contributing to burnout in academic otolaryngology-head and neck surgery (OHNS) and the pandemic’s effect on these factors. Further, attendees will evaluate internal and external interventions that can protect against burnout.

Objectives: Describe demographic and professional factors predictive of burnout in academic OHNS before and during the COVID-19 pandemic. Identify internal and external interventions protective against burnout. Study Design: Single institution; cross-sectional surveys, semi structured interviews. Methods: In 2018 and 2020, surveys on provider wellness/burnout were distributed electronically. In 2018, 3 semi structured interviews were conducted with faculty that reported no burnout. In 2021, a step challenge was implemented to boost wellness based on 2020 survey results. Results: Forty-two participants in 2018 and thirty participants in 2020 completed the survey. Faculty were dichotomized into a high burnout group in 2018 (8 faculty, 19.1%) and 2020 (11 faculty, 36.7%), in which burnout occurred a few times a week or more, and a low burnout group in which burnout occurred a few times a month or less. In multivariate analysis, full professors had 80% reduced odds of high burnout, approaching significance (p=0.08), relative to assistant professors. Female gender was associated with over a 5 fold increase in odds of high burnout (p=0.02). Interviews identified 3 overarching attitudes in faculty who reported no burnout: 1) focus on helping others; 2) happiness over compensation as currency; and 3) gratitude for the ability to have an impact. Finally, the step challenge appeared to be a successful remote community building intervention during a socially isolating time, with average steps per week increasing over the course of the challenge. Conclusions: Approximately 20% of faculty reported high burnout before the pandemic, and this proportion nearly doubled during the pandemic. These data may help practicing otolaryngologists identify protective and contributing factors in their own practice.

20. A Critical Review of 13 Years of Otolaryngology Consultations at an Academic Medical Center for Complaint of Foreign Body Sensation

Yu Han Chen, BS, New York, NY; Andre Shomorony, MD, New York, NY; Aaron N. Pearlman, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the clinical utility of common diagnostic modalities in adult patients presenting with foreign body sensation.

Objectives: To determine the prevalence of foreign body sensation and the sensitivity and specificity of various imaging modalities in the workup of foreign body sensation of the upper airway. Study Design: Retrospective chart review. Methods: Consult data extracted from our electronic medical records (EMR) between 2008 and 2020 were reviewed. Documented diagnoses including the keywords “globus” and “foreign” were used to identify consults for foreign body sensation or globus sensation among all consults to the otolaryngology service. All queries were reviewed and those unrelated to foreign body sensation of the upper airway or globus sensation were excluded. Clinical data including imaging modality and findings, relevant procedures, and diagnoses were collected. Results: Between 2008 and 2020, otolaryngology was consulted for complaints of “globus sensation” or “foreign body sensation” for 105 patients. Of the 105 patients, 29 patients (27.6%) received neck x-ray, 47 patients (44.8%) received chest x-ray, 58 patients (55.2%) received CT neck, 16 patients (15.2%) received CT chest, and 93 patients (88.6%) underwent flexible fiberoptic laryngoscopy (FFL) as part of their initial workup for foreign body sensation. The sensitivity and specificity were found to be 42.9% and 66.7%, respectively for neck x-ray, 38.5% and 95.2%, respectively for chest x-ray, 93.3% and 57.1%, respectively for CT neck, 62.5% and 75%, respectively for CT chest, and 23.4% and 93.5%, respectively for FFL. Of the 105 patients, 56 patients (53.3%) were found to have foreign body by direct visualization. Of the 56 patients, 53 patients had foreign body that was visualized in the OR, 3 patients had foreign body that was visualized on FFL but not in the OR, and 50 patients underwent successful removal of the foreign body. Conclusions: In this cohort of patients who presented with foreign body sensation, common initial workup included neck and chest x-rays, CT neck and chest, and FFL. CT neck was found to have high sensitivity, but low specificity; while chest x-ray and FFL were found to have low sensitivity, but high specificity.

21. Comparative Imaging Modalities in a Patient with Necrotizing Otitis Externa: Which Is Best?

Alexander Chern, MD, New York, NY; Sei Y. Chung, MD, New York, NY; Sagit S. Shavit, MD, Tel Aviv, Israel; Gul Moonis, MD, New York, NY; Ana H. Kim, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the comparative pros and cons of options available for imaging necrotizing otitis externa through a unique case in which a patient underwent several imaging modalities simultaneously.

Objectives: Technetium and gallium scans have traditionally been used to diagnose and monitor necrotizing otitis externa (NOE). We describe a case of a patient that underwent multiple imaging modalities for evaluation of NOE at presentation and followup. Study Design: Case report. Methods: Radiographic evaluation of NOE (technetium, gallium, and MRI [skull base protocol] scans). Results: A 63 year old with poorly controlled diabetes presented with left sided otalgia and hearing loss. Laboratory tests indicated elevated sedimentation rate, elevated C reactive protein (CRP), and significant hyperglycemia. MRI revealed opacification of left mastoid and petrous air cells, EAC and middle ear with extension of this inflammatory process to the left temporomandibular joint, prevertebral space, carotid space and parapharyngeal space. Gallium scan showed intense radiotracer uptake within the left petrous and squamous portion of the temporal bone. Technetium scan was also significant for uptake at the left temporal bone, but region of radiotracer uptake was more extensive compared to gallium scan. Patient was treated with intravenous antibiotics for several weeks. Followup gallium scan showed no significant change in left temporal bone radiotracer uptake. The followup MRI better reflected patient’s clinical course after treatment (improved symptoms, significantly decreased CRP) with decreased enhancing soft tissue in prevertebral and parapharyngeal spaces, residual opacification of mastoid air cells. Conclusions: In this case, MRI was an excellent alternative to technetium/gallium scans to diagnose and monitor NOE. Compared to MRI, technetium/gallium scans provide little anatomic detail, high costs/radiation exposure, limited availability. On followup, MRI findings were more consistent with patient’s overall clinical course.

22. Histopathology of the Tongue in a Hamster Model of COVID-19

John Michael Coggins, BS, Galveston, TX; Rebecca Cook, BS, Galveston, TX; Shinji Urata, MD PhD, Galveston, TX; Megumi Urata, MD, Galveston, TX; Nantian Harsell, BS, Galveston, TX; Tomoko Makishima, MD PhD, Galveston, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the basic anatomy and physiology of the tongue, the relevance of ageusia in the COVID-19 pandemic, and our current understanding of the pathophysiology of COVID-19 related ageusia.

Objectives: This study seeks to identify the location of SARS-CoV-2 within the tongue over the time course of a COVID-19 infection and study the effects of the virus on the histology of the tongue. Study Design: A total of 36 hamsters were inoculated intranasally with SARS-CoV-2 or a vehicle control with 32 receiving the viral inoculation and 4 receiving the vehicle control. The 32 infected hamsters were divided into 8 groups of 4, with each group being sacrificed at a different time post infection. Each tongue was assessed

for histological changes with H&E staining, gross changes by counting the fungiform and filiform papillae, and location of infection within the tongue by immunohistochemistry with SARS-CoV-2 NP antibody. Methods: Golden Syrian hamsters were inoculated intranasally with SARS-CoV-2 virus or vehicle. Whole tongues were collected at 2, 3, 5, 8, 17, 21, 35, and 42 days post infection (dpi) for analysis. Fungiform and filiform papillae of the tongue were counted using a dissecting microscope at 25X magnification. After fixation with 10% formaldehyde, tongues were embedded in paraffin, thin sectioned and stained for H&E or labeled with SARS-CoV-2 NP antibody. Results: Consistent and marked labeling of the SARS-CoV-2 antigen was present in the circumvallate papillae taste buds from dpi2-dpi8 and the autonomic ganglia from dpi2-dpi35. Weaker labeling was observed in the serous microsalivary glands of the posterior tongue. The numbers of fungiform and filiform papillae did not show much change throughout the course of the infection. Conclusions: Our findings suggest that the SARS-CoV-2 virus preferentially infects the circumvallate papillae taste buds, potentially acting as a mechanism for causing loss of taste. This effect could be enhanced by a diminished secretion of saliva caused by infection of the serous microsalivary glands and the autonomic ganglia which innervate them.

23. Use of Meclizine in Patients with Benign Paroxysmal Positional Vertigo

Kathryn E. Cushing, BS, Chicago, IL; Matthew Au, BS, Chicago, IL; Kyle Kozak, BS, Chicago, IL; Luke P. Trapp, BA MS, Chicago, IL; Heather M. Weinreich, MD MPH, Chicago, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to identify that meclizine and other antihistamines are not standard of care for BPPV and should be avoided in the course of treatment, particularly for patients over 65 years of age.

Objectives: To determine the rates of meclizine prescriptions provided for benign paroxysmal positional vertigo (BPPV) at the time of diagnosis within a university hospital system. Study Design: Descriptive administrative database review. Methods: Data was extracted from the university's electronic medical record. The prescription, diagnosis, and visit were considered associated if they occurred on the same day, for the same patient, according to corresponding timestamp. Results: Of 1,342 visits that resulted in a diagnosis with BPPV, 63.63% of which were in an outpatient primary care setting, 19.37% with an otolaryngologist, 10.28% in the emergency department, 4.55% in urgent care, and 2.16% in an inpatient setting. Meclizine prescriptions given at the time a patient was diagnosed with BPPV occurred at 336 or 25% of all visits. In order of highest likelihood, meclizine was prescribed at 66% of in-patient, 53% of emergency dept, 48% of urgent care, 24% of outpatient, and 2% of otolaryngology visits when BPPV was diagnosed. 26.0% of patients given meclizine were over 65 years old. Conclusions: The most recent clinical practice guidelines for BPPV from the American Academy of Otolaryngology-Head and Neck Surgery recommended against treatment with medications. While meclizine has shown benefits in the treatment of nausea, vomiting, and motion sickness, there has been no evidence to suggest its effectiveness as primary treatment of BPPV. A large proportion of patients across healthcare settings continue to be prescribed meclizine, including those over 65, presenting an opportunity to standardize care for this common cause of vertigo across providers.

24. Variations in the Specialized Inner Ear Protein, Stereocilin, Relate to Noise Exposure

Diana Daniel, BS, Farmington, CT; Ashley Parker, MA BA, Storrs, CT; Ruby Feng, BA, Farmington, CT; Gianfranco Galantini, BS, Farmington, CT; Erika Skoe, PhD, Storrs, CT; Kourosh Parham, MD PhD, Farmington, CT

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the relationship between inner ear protein levels and varying degrees of noise dose, as well as potential implications of this relationship such as development of early detection prior to noise induced hearing loss.

Objectives: Specific ear proteins may serve as quantifiable biomarkers that assess cochlear health. We hypothesize that levels of stereocilin, a protein within the specialized sensory inner ear hair cells, will be influenced by daily noise exposure. Study Design: This study is a prospective cohort study assessing potential deviations in stereocilin levels in the serum of subjects with different amounts of daily noise exposure. Methods: Three weeklong measurements of average daily noise exposure were obtained from 30 young adult patients with clinically normal hearing through a body worn noise dosimeter. From this data, average daily sound energy [normalized to an 8 hour period, LAeq, 8h] and noise dose [%] were calculated and compared to circulating levels of stereocilin in the participant's serum. Results: We examined the relation between average serum stereocilin levels (log (ug/mL)) and average noise exposure levels [LAeq, 8h], ($r = -0.4824$, $p = 0.007$). Grouping by noise dose, subjects with a higher risk of noise damage (M=3.66) had lower average stereocilin levels than those with lower risk (M=4.45) [independent t test: 2.07, $p=0.0478$]. Conclusions: Subjects with increased levels of noise exposure exhibit lower levels of stereocilin, as demonstrated by the negative correlation coefficient. The relationship may be an early indicator of risk of cochlear injury prior to clinical onset and enable therapeutic interventions.

25. A Systematic Review of Hearing Loss and Fall Risk in the Elderly Population

Kyle Davis, MD, Little Rock, AR; Ozlem E. Tulunay-Ugur, MD, Little Rock, AR

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the importance of screening for hearing loss as a means to prevent falls in the elderly, which has significant mortality and morbidity in this population.

Objectives: As falls in the elderly can be devastating, addressing modifiable risk factors such as hearing loss (HL) can reduce mor-

bidity. We aimed to evaluate the recent literature on the association between HL and fall risk, specifically in the elderly population. Study Design: Systematic review of literature between 2000-2021. Methods: Search of PubMed, CINAHL, Cochrane, Web of Science databases was completed by a medical librarian. Search terms included “hearing loss”, “accidental falls”, “falls”, “falling”, “stumble”, “elder”, “elderly”, “senior”, “older”, and “geriatric”. Total of 229 abstracts were collected and after eliminating duplicates 175 titles and abstracts were reviewed for eligibility, with resultant 35 full text articles, by 2 independent reviewers. Study design, demographics, method of HL evaluation, definition of HL, fall definition, measured outcomes were recorded. PRISMA guidelines were used to assess the quality of the studies. Results: 19 studies met inclusion criteria. Most were cross-sectional in design (68%; 13/19). Only 4 studies were prospective. Audiometric testing was used in 7/19 (36.8%). Other methods included self-reported (42.1%; 8/19), whisper test or provider assessment (10.5%; 2/19), review of medical files (5.3%; 1/19). Among studies using audiometry, there was wide variation in the definition for HL. 14 (73.7%) studies found an association between HL and risk of falls in the elderly. Conclusions: While most studies found an association of HL and risk of falls among those 65 years or older, there is a wide range in study methodology and definitions of hearing impairment. Many relied on self-reported variables, few used audiometric evaluation. Well prepared guidelines would be of benefit.

26. Evaluation of Conflict of Interest and Published Position on Balloon Sinus Dilation for Chronic Rhinosinusitis

Nikita Deshpande, BS, Washington, DC; Jason R. Crossley, MD, Washington, DC; Michael Hoa, MD, Washington, DC; Jonathan P. Giurintano, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to summarize the self-disclosed and Open Payments registered conflicts of interest within balloon sinus dilation literature and understand the benefit of a financial payment search prior to publication.

Objectives: To determine the relationship between authors’ financial conflict of interest and published position on clinical use of balloon sinus dilation for chronic rhinosinusitis. Study Design: Retrospective cross-sectional analysis. Methods: A Google Scholar search was performed for editorials and reviews citing the ORIOS 2 Trial (Karenfilov et al. Int Forum Allergy Rhinol. 2013). Included articles were coded as favorable or neutral. Conflict of interest was recorded as disclosed by authors and as independently searched in the Open Payments registry. Results: Six articles from 27 authors were analyzed; eight authors contributed to favorable articles and nineteen authors contributed to neutral articles. When analyzing author payments using Open Payments, 7 of 8 authors of favorable articles (87.5%, 95% CI 77%-98%) received industry payments related to a sinus balloon dilation device as compared to 15 of 19 authors of neutral articles (78.9%, 95% CI 66.9%-90.9%). Among 7 authors of favorable articles with financial conflicts, 5 conflicts were undeclared (71.4%) compared with 5 undeclared conflicts among 15 authors of neutral articles with financial conflicts (33.3%, P = .09). Mean payments per author for favorable article authors (mean ± SD, $6,971.81 ± $15,137.70) were higher than those made to neutral article authors ($4492.92 ± 11,121.66, P = .69). Conclusions: Our study demonstrates a higher frequency of payment from device manufacturers to authors and higher total payment amount per author of articles favorable to balloon sinus dilation than neutral articles. Several undeclared conflicts were also identified during literature search, suggesting a role for independent financial conflict evaluation during the peer review process.

27. Does “Just in Time” Teaching of Ergonomic Principles Improve Posture of Trainees during Otologic Microscopic Surgery?

Brandon S. Gold, BA, New York, NY; Eleni A. Varelas, BA, New York, NY; Annie E. Arrighi-Allisan, BA, New York, NY; Evan S. Kominsky, BA, New York, NY; Enrique R. Perez, MD, New York, NY; Maura K. Cosetti, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the value of teaching ergonomic principles to otolaryngology trainees.

Objectives: To assess the impact of targeted teaching of ergonomic principles while completing lab based microscopic ear surgery. Study Design: Pilot, prospective trial. Methods: Otolaryngology residents (n=14) wore ergonomic sensors (inertial measurement units, IMUs) during microscopic temporal bone lab drilling. Prior to recording, participants were randomized to receive an instructional presentation on ergonomic principles (n=8, intervention group) or not (n=6, control group). Neck and back angles were analyzed for the initial 5 minutes of drilling. Results: Of 14 trainees, 78.6% had prior experience with otologic microscopic cases and temporal bone drilling, and 14.3% reported prior surgical ergonomic training or instruction. The intervention and control groups were matched in trainee height (p=0.54), handedness (p=0.83), stage of otolaryngology training (p=0.64), prior otologic microscopic surgery experience (p=0.35), prior temporal bone drilling experience (p=0.35), and prior teaching in ergonomic principles (p=0.47). Junior trainees (PGY 1-3) who did not receive “just in time” teaching adopted a posture with significantly higher risk back flexion compared to junior trainees who received the training (25.3° vs. 5.7°, p=0.04). There was no difference in back positioning among senior trainees (12.6° vs. -5.7°, p=0.13). Overall, there was no difference between the intervention and control groups in both neck positioning (-11.0° vs. -19.1°, p=0.17) and back positioning (8.6° vs. 19.1°, p=0.18). Conclusions: Musculoskeletal related pain is prevalent among otolaryngologists and otologists with data suggesting that symptoms begin during residency. Targeted “just in time” teaching of ergonomic principles is feasible and may be effective for development of healthy postural habits, especially among junior trainees.

28. Exploring the Association between Hearing Loss and Frequency of Sexual Intercourse

Maeher R. Grewal, BS, New York, NY; Justin S. Golub, MD MS, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the association between hearing loss and socialization. Adult hearing loss is associated with social isolation and many comorbidities that reduce quality of life including dementia and depression. However, its relationship with sexual activity has not yet been studied. We found that hearing loss is not associated with less sex frequency, although a near association was seen in women.

Objectives: Hearing loss (HL) has been associated with poorer socialization. We aimed to explore the association between HL and sexual activity in the United States population. Study Design: Cross-sectional epidemiological study in the National Health and Nutrition Examination Survey (NHANES), 1999-2016. Participants were U.S. adults ages 18-59. Methods: Multivariable linear regressions controlling for age were conducted to analyze the association between HL (measured by 4 frequency better ear pure tone average) and reported annual sexual intercourse frequency (ASIF). ASIF was categorized into: never, once, 2-11 times, 12-51 times, 52-103 times, and 104+ times. Regressions were performed using the midpoint of the category frequency range, with 125 as the maximum. Regressions were additionally stratified by gender. Results: 5,102 participants had audiometric and ASIF data; 48.9% (n=2,493) were female. 4.1% (n=207) of participants reported an ASIF of never, 4.9% (n=248) reported once, 23.4% (n=1,193) reported 2-11 times, 33.1% (n=1,688) reported 12-51 times, 20.4% (n=1041) reported 52-103 times, and 14.2% (725) reported 104+ times. There was no significant association between HL and ASIF in the population overall, controlling for age. When stratified by gender, each 10 dB worsening of HL in women was associated with trend towards 2.39 fewer sexual encounters per year that narrowly missed significance (95% CI = -4.82, 0.04; p=0.054). This suggests that the relationship between HL and sexual frequency in women should be further investigated. Conclusions: Although trending towards a relationship in women, HL was not significantly associated with decreased sexual frequency in the U.S. population.

29. WITHDRAWN - Audiometric Outcomes in Patients with COVID-19: A Systematic Review and Meta-Analysis

Rachana Gudipudi, BS, Charleston, SC; Seth S. Jeong, BA, Charleston, SC; Shaun A. Nguyen, MD, Charleston, SC; Theodore R. McRackan, MD, Charleston, SC; Ted A. Meyer, MD PhD, Charleston, SC; Paul R. Lambert, MD, Charleston, SC

30. Evaluating Key Factors Influencing Otolaryngology Education and Career Choice: A National Survey Study of Medical Students

Andy Mina Habib, MPH, Washington, DC; Victoria Yu, MD, New York City, NY; Michelle Yu, MD, New York City, NY; Jonathan Overdevest, MD PhD, New York City, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the otolaryngology clerkship length that most medical students believe is ideal for adequate exposure, as well as better understand the factors/experiences that both preclinical and clinical students perceive as most significant to their otolaryngology education.

Objectives: To evaluate what factors impact the educational experience and decision to pursue a career in otolaryngology among medical students in the United States. Study Design: National questionnaire of preclinical and clinical medical students. Methods: We circulated a web based, multiple choice questionnaire among otolaryngology interest groups at regionally representative medical schools. Participants were asked about the otolaryngology clerkship experience at their institution, factors that may dissuade them from applying to the field, and which otolaryngology exposures/interactions substantially impacted their decision to pursue a career in otolaryngology. Counts and frequencies were used to generate descriptive statistics. Results: Completed responses from 201 preclinical and clinical medical students were recorded. Total counts/frequencies for different questions varied based on logic branching and the applicable population. Otolaryngology clerkship rotation length was notably varied with 11 medical schools (61%) reporting a 2 week or shorter rotation, compared to 8 medical schools (39%) with a 3 week or longer rotation. Among surveyed clinical medical students, most (73%; 40/55) felt that 3 weeks or longer would be an ideal clerkship rotation length. Among all students, the top three factors potentially dissuading them from pursuing otolaryngology were lack of exposure to the field (29%; 58/201), perceived competitiveness of the specialty (25%; 50/201), and the types of procedures/surgeries (17%, 34/201). The most significant otolaryngology exposure varied by educational progression with preclinical students selecting “interest group” most often (35%, 30/85) followed by “research opportunities” (26%, 22/85), while clinical students selected their “home sub-internship” most often (28%, 20/72) followed by “clerkship rotation” (17%, 12/72). Conclusions: Medical students perceive that an average clerkship rotation length of 3 weeks or more is ideal to gain adequate exposure to otolaryngology. Clerkship length and timing within the curriculum is an important consideration since clinical students also indicated that their clerkship was among their most important exposures, along with their sub-internship. Increasing interest group and research involvement may help provide early access to an otolaryngology experience for more preclinical students. Our findings provide valuable feedback to medical school administrators and clerkship directors tasked with creating a student centered, effective otolaryngology curriculum.

31. Pain Management Protocol for Otolaryngologic Procedures Stratified by Expected Levels of Postoperative Pain

Kiefer Hock, MD, Cincinnati, OH; Raisa Tikhtman, MD, Cincinnati, OH (Presenter); Colin Cotton, BA, Cincinnati, OH; Marisa Brizzi, PharmD BCPS AAHIVP, Cincinnati, OH; Chad Zender, MD FACS, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the potential benefits of implementing a standardized postoperative pain management protocol for otolaryngologic procedures, with specific attention to reducing opioid prescriptions.

Objectives: To assess the impact of a postoperative pain management protocol tailored to anticipated levels of pain following common otolaryngologic procedures at a large academic institution, with a focus on multimodal therapies and limiting opioid prescriptions. Study Design: Retrospective cohort study. Methods: A standardized pain management protocol was developed collaboratively by the departments of otolaryngology and pharmacy, stratifying procedures by anticipated levels of postoperative pain. Protocol implementation was facilitated through electronic medical record integration and targeted education. Demographic and postoperative pain management prescription data was collected for patients undergoing otolaryngologic surgery prior to and then following protocol implementation. Results: 741 patients were included in the study. An average of 20 opioid tablets was prescribed postoperatively to the 281 patients who underwent surgery prior to protocol implementation, compared with 14.8 opioid tablets prescribed to the 460 patients who underwent surgery post-implementation ($P<0.0001$). The average morphine equivalent daily dose prescribed per patient significantly decreased following protocol implementation (32.7 versus 14.8, $P <0.0001$). Leapfrog opioid metric compliance was significantly improved for patients who underwent thyroidectomy post-implementation compared with pre-implementation (52.8% versus 26.9%, respectively, $P <0.025$). No significant adverse events were reported in association with protocol implementation. Conclusions: This study demonstrates that a protocolized approach to postoperative pain management for common otolaryngologic procedures can effectively reduce opioid prescriptions and shift the focus to multimodal therapies. Opioids are likely overprescribed in the postoperative setting, and many patients can safely manage their pain with combinations of acetaminophen and nonsteroidal anti-inflammatory drugs.

32. Minimal Clinically Important Difference of Symptoms of Nocturnal Obstruction and Related Events (SNORE-25) Instrument in Patients with Obstructive Sleep Apnea

Allison K. Ikeda, MD, Seattle, WA; Edward M. Weaver, MD MPH, Seattle, WA

Educational Objective: At the conclusion of this presentation, the participants should understand the importance of the minimal clinically important difference for outcome measures and with a focus on the Symptoms of Nocturnal Obstruction and Related Events (SNORE-25) instrument.

Objectives: The Symptoms of Nocturnal Obstruction and Related Events (SNORE-25) is a 25 item validated, sleep apnea specific quality of life instrument, but the minimal clinically important difference (MCID) has not been quantified. This study quantifies the MCID of SNORE-25. Study Design: Secondary analysis of 1) a randomized trial of adult patients with newly diagnosed sleep apnea treated with continuous positive airway pressure therapy (CPAP), and 2) a separate sleep surgery cohort. Methods: SNORE-25 (scale 0-5, 5 worst) was recorded at baseline and six months after initiating CPAP or surgical therapy. A change of 3 (“somewhat better”) in the 15 item (range -7 to +7) global sleep apnea quality of life change instrument was defined as the anchor for MCID, calculated as the mean SNORE-25 change scores (anchor method). The MCID was also calculated as 0.2 standard deviations of the baseline SNORE-25 (distribution method). Results: The trial sample (N=240) characteristics: mean+/-SD age 47+/-12 years, 65% males, baseline apnea-hypopnea index 33+/-25, 6 month CPAP use range 0-545 minutes/night, baseline SNORE-25 1.5+/-0.8, 6 month SNORE-25 change -0.5+/-0.7, and global sleep apnea quality of life change 2.1+/-2.7. The cohort sample (N=90) was similar. Anchor method MCID ranged 0.6+/-0.5 to 0.7+/-1.0 (trial N=20 and cohort N=9 at the anchor). Distribution method MCID was 0.2 in both samples (N=240 and N=90). Conclusions: The MCID for SNORE-25 is 0.2-0.7. The MCID is necessary for clinical interpretation of change scores of SNORE-25 with sleep apnea treatment, and for estimating trial sample sizes where SNORE-25 is the primary outcome.

33. Evaluating the Impact of Epiglottic Collapse on Outcomes of Hypoglossal Nerve Upper Airway Stimulation

Nikhita Jain, MD, Philadelphia, PA; Emily Sagalow, BS, Philadelphia, PA; Maria Armache, MD, Philadelphia, PA; Maurits Boon, MD, Philadelphia, PA; Colin Huntley, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe how epiglottic obstruction impacts efficacy of upper airway stimulation (UAS).

Objectives: To examine whether patients with epiglottic collapse on drug induced sleep endoscopy (DISE) perform as well as patients without epiglottic collapse following UAS. Study Design: Retrospective cohort study. Methods: Patients who underwent DISE and UAS at our institution were included in this study. The primary outcome was mean change in preoperative and postoperative apnea-hypopnea index (AHI); secondary outcomes included nadir oxygen saturation (NOS) and Epworth Sleepiness Scale (ESS). Patients with epiglottic collapse were compared to those without epiglottic collapse. Comparisons were also drawn between patients with tongue base (BOT) collapse +/- epiglottic collapse. Statistical analysis utilized IBM SPSS software. Results: 370 patients un-

derwent UAS from 2014-2021; preoperative DISE revealed 202 patients with epiglottic collapse. 224 patients had partial or complete BOT collapse, of which 194 had concurrent epiglottic collapse (87%). On preoperative and postoperative sleep studies, patients with epiglottic collapse had a mean improvement in AHI of 12.98; those without epiglottic collapse improved by 22.3 ($p<0.055$). The same trend applied for patients with partial BOT collapse +/- epiglottic collapse (mean improvement of 10.1 vs 35.2, $p<0.011$). Patients with complete BOT collapse +/- epiglottic collapse had a mean improvement of 15.5 vs 17.8 ($p<0.67$). Comparison of preoperative and postoperative NOS did not yield any statistical differences. Data analysis regarding ESS scores is currently ongoing. Conclusions: Patients without epiglottic collapse demonstrated greater improvement in AHI following UAS compared to those with epiglottic collapse. This trend applied to patients with BOT collapse and concurrent epiglottic collapse. Additional intervention for epiglottic collapse may enhance overall outcome of UAS.

34. Hearing the Masses: A Qualitative Study on the Options for At-Home Hearing Test via Phone Applications

Tyler Alise Le, Cupecoy, St. Maarten

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the importance and need of increasing the number of quality hearing tests via cellular devices in order to increase access to basic hearing evaluations.

Objectives: To determine the number and quality of software applications listed in the Apple App Store and the Google Play Store that can be used in order to reliably test hearing. Study Design: A qualitative study. Methods: The Apple App Store and Google Play Store were searched in October 2021 using the prompt “hearing test”. Apps discovered that were usable to test human hearing were included. Applications located were evaluated for quality of construction and ease of use. Results: 19 apps were found. 16 (85%) had instructions to best optimize the results. Only 3 (16%) apps stated were developed with the input of an otolaryngologist and only 1 (5%) had input from an audiologist. These results are preliminary and other apps are currently under the experimental process. Conclusions: Most applications were developed without the consultation of a healthcare provider. Remote access to hearing healthcare is important for patients who may have difficulty with access.

35. Neonatal TMJ Dysfunction

Tyler Alise Le, Cupecoy, St. Maarten; Jason DeGiovanni, MD, Buffalo, NY; Michele Carr, MD DDS PHD, Buffalo, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the various etiologies of TMJ dislocation and describe a unique case of its presentation in a neonate.

Objectives: Neonatal temporomandibular joint (TMJ) dysfunction is unusual. The purpose of this study is to describe a case of neonatal TMJ dysfunction and to review the literature on this topic. Study Design: Case report. Methods: A case report and a literature review on TMJ in infants. Results: A 6 day old female was seen with both parents for evaluation of a dislocating jaw. Mom had been breastfeeding successfully but noticed that the baby had a click with each swallow. Her jaw came out and down as she fed, then went back to normal position. Over the last few days mom felt that only 1 side was involved as her jaw movement seemed asymmetrical. The PCP had witnessed the click with sucking reflex. The baby was normal in appearance and was otherwise healthy. The pediatric otolaryngologist witnessed deviation of the jaw toward the left with a palpable click with mouth opening and spontaneous reduction with mouth closing. Over the next month the symptom resolved. Literature review showed few cases of TMJ dislocation in infants, most describing fixed dislocation related to vomiting or crying. Development of the TMJ favors early dysfunction as the joint is lax and the mandibular fossa flat in infancy. Conclusions: Neonatal TMJ dislocation is an uncommonly diagnosed entity that may improve with time.

36. National Survey of Otolaryngologists’ Perspectives on Telemedicine Utility across Otolaryngologic Conditions

Braeden Lovett, BA, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to have a better understanding of the perceptions of otolaryngologists on the utility of telemedicine for various chief complaints.

Objectives: To determine current and pre-COVID-19 telemedicine practices, understand perceived benefits and barriers to telemedicine visits, and assess the applicability of telemedicine across various clinical conditions. Study Design: Cross-sectional survey. Methods: Web based survey distributed to members of the American Academy of Otolaryngology-Head and Neck Surgery. Demographics, current and pre-COVID-19 telemedicine usage, benefits, barriers, and perceived utility in the assessment of 36 different otolaryngological conditions were collected. Results: Out of 337 respondents, 261 otolaryngologists (74.3% males, mean age 53 years, 58.2% generalists, 50.2% in private practice) completed the survey. Telemedicine utilization increased from pre-COVID (8.4%) to present (74.3%, $p < .001$) with the majority (72.7%) currently performing 1-5 telemedicine visits per week. 80% report to be at least somewhat satisfied with current telemedicine practice. Most common perceived benefits of telemedicine included improved patient access, patient satisfaction, and continuity of care. Most commonly reported barriers were concerns regarding quality of care, internet access reliability, and reimbursement rates. A mean of 46.4% and 20.2% respondents found telemedicine to be useful across all conditions for followup and initial visits, respectively. Conditions for which > 75% of respondents indicated telemedicine to not be useful were cerumen impaction, tracheostomy care, and dyspnea. Conclusions: Telemedicine continues to have a valuable

role in the majority of otolaryngology practices 1 year after the onset of the COVID-19 pandemic. While there are discrete limitations to telemedicine, many otolaryngologists find it useful for followup care across a wide spectrum of clinical complaints/conditions.

37. Utility of Cognitive Screeners in the Preoperative Evaluation of Cochlear Implant Candidates: Relationship with Post-Activation Speech Recognition

Heidi Martini-Stoica, MD PhD, Chapel Hill, NC; Margaret Dillon, AuD, Chapel Hill, NC; Andrea Bucker, AuD, Chapel Hill, NC; Matthew Dedmon, MD PhD, Chapel Hill, NC; Morgan Selleck, MD, Chapel Hill, NC; Kevin Brown, MD PhD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the utility of cognitive screeners as part of the preoperative test battery to predict the post-activation speech recognition for adult cochlear implant recipients.

Objectives: To determine if cognitive scores measured at the preoperative visit aid in predicting post-activation speech recognition for adult cochlear implant (CI) recipients. Study Design: Retrospective cohort study. Methods: The Brief Version of the Mini Mental Status Exam 2 (MMSE-BV) was completed at the preoperative evaluation for 240 adult CI candidates. Aided speech recognition was evaluated with recorded consonant nucleus consonant (CNC) word lists at 6 months and 1 year post-activation. Pearson correlations evaluated the relationship of MMSE-BV scores and age at implantation to the 1 year CNC word score. Results: Preoperative MMSE-BV scores ranged from 9 to 16 (mean: 15, SD: 1). Age at implantation ranged from 21 to 95 years (mean: 69 years, SD: 11 years). The mean CNC word score at 1 year was 47% (SD: 19%). For age at implantation, there was a significant, modest correlation with performance at 6 months ($r=-.19$, $p=0.004$) and 1 year ($r=-.28$, $p<0.001$). For preoperative MMSE-BV scores, there was a significant, moderate correlation with performance at 6 months ($r=.30$, $p<0.001$) and modest correlation with performance at 12 months ($r=.28$, $p<0.001$). Conclusions: Preoperative cognitive status as measured with the MMSE-BV may contribute to predicting post-activation speech recognition for adult CI recipients, among other biologic/audiologic factors. The MMSE-BV takes approximately less than 5 minutes to complete. The present results suggest the utility of including the MMSE-BV in the preoperative evaluation of adult CI candidates, given the short duration to complete and association with post-activation performance. Inclusion of the MMSE-BV as preoperative evaluation tool can aid in patient selection and counseling with regards to expectations for outcomes with a CI.

38. Management of the Facial Nerve following Temporal Bone Ballistic Injury

Anne K. Maxwell, MD, New Orleans, LA; John C. Lemoine, BS, New Orleans, LA; Jacob B. Kahane, MD, Baton Rouge, LA; Celeste C. Gary, MD, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe common patterns of temporal bone fracture seen in ballistic trauma with facial nerve injury and discuss appropriate surgical interventions, understanding that the nerve many be injured in multiple locations.

Objectives: To understand the patterns of temporal bone fracture and facial nerve injury from ballistic trauma. Study Design: Retrospective case series. Methods: Retrospective review of 41 patients evaluated following temporal bone ballistic injury at a single institution, university based level one trauma center between 2012-2021. Demographics, facial nerve status, CT images, interventions, complications, and outcomes were reviewed. Results: Mean age was 32.2 years (range 5-58 years); 78% male. Racial demographics reflected the surrounding community. Seven mortalities occurred. Seventeen patients (41%) demonstrated facial nerve injury. Of those, 11/17 displayed immediate paralysis, 1 delayed, 5 unknown (due to altered mental status). On consultation, House-Brackmann grade 6 paralysis was common (11/17). Fracture was otic capsule sparing in 15/17 (88%), universally comminuted, with significant disruption along the mastoid tip (11/17), external auditory canal (12/17), and periauricular soft tissues (9/17). Eight patients underwent surgical intervention: transmastoid facial nerve decompression to remove compressive bony spicules (n=4); eye protection surgery (n=3); and peripheral facial nerve exploration (n=1), noting transection at the pes. One required middle cranial fossa and transmastoid repair of cerebrospinal fistulae in setting of severe meningitis. House-Brackmann scores improved in 75% following transmastoid nerve decompression despite CT evidence of additional injury in its extratemporal course. Conclusions: Common patterns of temporal bone fracture seen in blunt trauma (longitudinal/transverse, otic capsule sparing/disrupting) were not found in patients with ballistic facial nerve injury. Rather, injury was commonly apparent in the external auditory canal, mastoid tip, and periauricular soft tissues. Clinicians should have high suspicion for extratemporal facial nerve injury following ballistic trauma.

39. Erosion of a Ventriculoperitoneal Shunt into the Hypopharynx: A Case Study

Nicole Molin, MD, Philadelphia, PA; Lavanya Nagappan, MD, Camden, NJ; Karl Whitley, MD, Philadelphia, PA

Educational Objective: To present a rare case of ventriculoperitoneal shunt (VPS) erosion into the hypopharynx; a presentation that is seldomly reported in the otolaryngology literature. We aim to describe presentation, workup and management.

Objectives: To present a rare case of ventriculoperitoneal shunt (VPS) erosion into the hypopharynx; a presentation that is seldomly reported in the otolaryngology literature. We aim to describe presentation, workup and management. Study Design: Case study. Methods: Retrospective chart review. Results: A 53 year old female with a history of VPS placement for aneurysmal subarachnoid

hemorrhage presented 18 months after placement with VPS malfunction and transoral extrusion. CT neck showed migration of the distal shunt tubing through the pyriform sinus. The patient was taken emergently to the operating room for removal under direct visualization. With the help of neurosurgery, the distal VPS tubing was located in the neck clamped and divided. The distal segment was held in place. There was good flow noted through the more proximal end of the tubing and new distal shunt tubing was connected. The distal tubing was then directly visualized in the hypopharynx via direct laryngoscopy. The tubing was slowly withdrawn under direct visualization as it was released from the neck until the tubing was completely removed. The pharynx, hypopharynx and larynx were inspected without any serious violation. The patient remained in the neurosurgical ICU on a prolonged course of antibiotics and close observation for signs of mediastinitis. An esophagram POD10 showed no evidence of a leak prior to oral intake. Conclusions: VPS erosion into the airway is a rare event. Management should be prompt and in conjunction with neurosurgery. Removal under direct visualization allows for inspection of the erosion site which can help guide management.

40. Gendered and Emotive Language in Otolaryngology Letters of Recommendation: An Analysis of Residency Applications

Sifon Ndon, MD, San Francisco, CA; Anna Butrymowicz, MD MS, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how gender and race based biases affect the otolaryngology residency application process.

Objectives: The study objective was to ascertain whether there is a differential use of gendered and emotive language when comparing letters of recommendation written for otolaryngology residency applicants belonging to various gender and racial groups. Study Design: This study was a retrospective review. Methods: We selected a random sample of otolaryngology applications submitted to a single institution from the 2017 to 2020 residency application cycles. The letter content was analyzed using the Tomforth gender bias calculator and the Linguistic Inquiry and Word Count engine. Independent variables included word count, number of gendered words, and linguistic summary variables intended to encapsulate the overall sentiment of the letter. Analysis was performed using a chi squared test of medians with results stratified by applicant gender, letter writer gender, and applicant race. Results: A total of 272 letters for 72 applicants were analyzed. A majority of applicants and letter writers were male (67% and 78%, respectively). When analyzed by applicant gender, no significant difference in letter content was found. However, we found that female letter writers were more likely to write longer letters and use more “female” gendered words (P= 0.03) along with words that convey hesitancy (P= 0.002). Male letter writers were more likely to use positive emotion words (P= 0.03). The number of non-White applicants was too small to detect any significant difference by race. Conclusions: The data suggests that female writers may have a tendency to communicate more hesitation and use fewer positive words in letters of recommendation. Our findings also highlight a lack of minority representation in otolaryngology.

41. Predictors of Length of Stay, Reoperation, and Readmission following Transcervical Zenker’s Diverticulectomy

Monet C. McCalla, BS, Athens, OH; Ariel Omiunu, BS, Newark, NJ; Anthony M. Saad, BA, Newark, NJ; Catalina Jaramillo-Moncayo, MD, Bogota, Columbia; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand risk factors associated with adverse outcomes after Zenker’s diverticulectomy, including prolonged length of hospital stay, unplanned 30 day readmission, and unplanned reoperation.

Objectives: To identify perioperative risk factors associated with prolonged hospital length of stay (LOS), unplanned 30 day readmission, and reoperation following transcervical Zenker’s diverticulectomy. Study Design: Retrospective cohort study. Methods: Patients who underwent open Zenker’s diverticulectomy (current procedural terminology [CPT] code 43130) between 2005-2018 were identified in the National Surgical Quality Improvement Program (NSQIP) database. Univariate and multivariate logistic regression analyses were performed to identify predictors for extended LOS, unplanned 30 day readmission, and reoperation. Results: Among the 715 patients isolated, the mean age was 70.3 ± 12.0 years, and the median LOS was 2.0 days (interquartile range [IQR], 1.0 to 4.0 days). Risk factors for prolonged LOS included female gender (odds ratio [OR] 1.735, p=0.004), history of weight loss (OR 6.058, p 83 minutes (OR 3.310, p 83 minutes was a positive predictor (OR 2.699, p=0.020). Among patients undergoing reoperation, female gender was a negative predictor (OR 0.324, p=0.018), and emergent procedures were a positive predictor (OR 18.558, p=0.023). Conclusions: To our knowledge, this is the first multi-institutional retrospective study to be performed on LOS, readmission, and reoperation for patients undergoing open diverticulectomy. Preoperative counseling for patients at risk for adverse outcomes may reduce postoperative costs and lessen the burden of limited hospital resources.

42. Self-Localization as a Diagnostic Component in the Evaluation of Eustachian Tube Disease

Sean M. Parsel, DO, Philadelphia, PA; Erika M. Moxley, MS, New Orleans, LA; Nrusheel Kattar, MD, Shreveport, LA; Alvaro I. Navarro, MD, New Orleans, LA; Blair M. Barton, MD, New Orleans, LA; Edward D. McCoul, MD MPH, New Orleans, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the relationship of patient localized symptoms of aural discomfort and the presence or absence of underlying eustachian tube dysfunction.

Objectives: The perception of aural fullness can be localized to several anatomic sites. This study seeks to evaluate the predictive ability of self-localization to distinguish obstructive eustachian tube dysfunction from nonobstructive salpingitis. Study Design: Cross-sectional. Methods: Adult patients with a primary complaint of aural fullness were enrolled from an otolaryngology clinic at a tertiary medical center. Each patient was asked to use a finger to localize the site of aural fullness, such as to the external auditory canal (EAC), the preauricular region, or the infra-auricular region with a trajectory to the infratemporal fossa (ITF). Eustachian Tube Dysfunction Questionnaire (ETDQ-7) responses were recorded. Tympanometry and nasal endoscopy were performed. Nasopharyngeal inflammation was quantified using the Endoscopic Evaluation of the Eustachian Tube (3ET) score. Results: Among 45 patients enrolled, 16 localized to the EAC, 21 localized to the ITF, and 8 localized to the preauricular region. The mean age was 47.8 years with 35.6% female, which did not significantly differ between groups. Tympanometric peak pressures were most abnormal in the EAC group (-99.6 daPa) compared to ITF (-9.0 daPa) and preauricular (-9.1 daPa) groups (p=0.0001). Compliance did not differ between groups (mean 0.7 mmOh; p=0.86). The 3ET score was lowest for the preauricular group (median 1) compared to EAC (median 4) and ITF (median 4) groups (p=0.0001). Mean ETDQ-7 score was 4.4 without significant variation between groups (p=0.99). Conclusions: Localization to the ITF is suggestive of nonobstructive eustachian salpingitis. Self-localization is a useful component of the diagnostic evaluation of aural fullness.

43. Relationship between Prolonged Operative Time and Postoperative Complications in Mastoidectomy

Rushi Patel, BA, Newark, NJ; Ariel Omiunu, BS, Newark, NJ; Aatin K. Dhanda, BA, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact of prolonged operative time on postoperative complications in patients undergoing mastoidectomy.

Objectives: Prolonged operative times (OT) have been associated with negative outcomes in various surgical fields. We evaluate the relationship between operative time and complications in patients receiving mastoidectomy and tympanomastoidectomy. Study Design: Retrospective database review. Methods: The 2012-2018 National Surgical Quality Improvement Program (NSQIP) database was queried for patients undergoing mastoidectomy or tympanomastoidectomy. Patients were analyzed separately depending on receiving mastoidectomy alone (MA) or tympanomastoidectomy (TM). Patients with OT greater than 75th percentile were defined to have prolonged OT. Univariate and multivariate analyses were performed. Results: A total of 4,660 patients met inclusion criteria with 713 (15.3%) receiving MA and 3,956 (84.7%) receiving TM. Patients were predominately male (52.5%) and White (61.6%) with a median age of 48 years. For patients receiving MA, operative times greater than 225.5 minutes were considered prolonged (n=178, 25.0%). Operations longer than 207 minutes were considered prolonged for TM patients (n=978, 24.7%). MA patients with prolonged OT had significantly longer LOS (3.80 vs. 0.87 days, p<0.001). For MA patients, multivariate regression analysis demonstrated signification associations between prolonged OT and all complications (OR=4.96 [1.67-14.69], p=0.004), medical complications (OR=5.92[1.18-29.79], p=0.031), and surgical complications (OR=4.05 [1.20-13.71], p=0.025). For TM patients, multivariate analysis revealed no significant associations between OT and complications. However, these patients with prolonged OT did have significantly higher odds of reoperation (OR=3.67 [1.53-8.82], p=0.004). Conclusions: Prolonged OT is associated with longer LOS and increased risk for complications in patients receiving mastoidectomy. For patients receiving tympanomastoidectomy, OT is not associated with complications but is with risk for reoperation.

44. Comparison of Upper Airway Obstruction on Drug Induced Sleep Endoscopy in Adults with Upper Airway Resistance Syndrome vs. Obstructive Sleep Apnea

Anusha Ponduri, BA, Bronx, NY; Juan Lin, PhD, Bronx, NY; Jianyou Liu, MS, Bronx, NY; Steven Park, MD, Bronx, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the different sites of upper airway obstruction in obstructive sleep apnea and upper airway resistance syndrome. This understanding can inform treatment options for patients.

Objectives: This study aims to compare patterns of upper airway obstruction in upper airway resistance syndrome (UARS), defined as AHI<5, and obstructive sleep apnea (OSA), defined as AHI<5, utilizing drug induced sleep endoscopy (DISE). Study Design: Retrospective chart review. Methods: The study sample consisted of 413 adult patients, who underwent DISE as part of their evaluation and management for sleep disordered breathing between January 1, 2017, and December 1, 2020, at a tertiary care center. Patient medical records were reviewed per the surgical coding for DISE. DISE findings were reported by the VOTEL classification system: the level of collapse was described as occurring at the velum, oropharynx, tongue base, epiglottis, and the lingual tonsils. The degree of collapse was reported as complete, partial, or none. The pattern of the obstruction was described as anteroposterior, lateral, or concentric when applicable. Patients were divided into four groups based on their AHI scores: group 0 was upper airway resistance (AHI<5), group 1 was mild (AHI≥ 5 to < 15), group 2 was moderate (AHI≥ 15 to 30), and group 3 was severe (AHI≥ 30) OSA. Results: The study sample consisted of 413 adult patients, of which 251 were male and 162 females. Ages ranged from 18 to 83 (42.5 +/- 14.1), and BMI ranged from 17.6 to 57.5 (28.7 +/- 6.4). Compared to those with AHI < 5, patients with AHI > 30 were significantly more associated with increasing severity of palatine tonsil grading (p=.0191), lingual tonsil grading (p=.0670), velum collapse (p-value < 0.0001), oropharyngeal collapse (p-value < 0.0001), and epiglottis collapse (p-value < 0.0001). Compared to those with AHI > 30, patients with AHI < 5 were significantly more associated with tongue base collapse (p-value < 0.0001). Con-

clusions: Despite the controversial nature of UARS diagnosis, both OSA and UARS patients had significant levels of obstruction on DISE findings. Tongue base collapse was significantly associated with UARS as compared to OSA, suggesting that the tongue base may be a significant cause of symptoms in patients with UARS and be an area of therapeutic intervention.

45. An Evaluation of the Predictive Value of a Modified Frailty Index on Perioperative Morbidity and Mortality following Otologic Surgery

Kevin James Quinn, MD, Richmond, VA; Yuchi Ma, BS, Richmond, VA; Matthew Carli, BA, Richmond, VA; Daniel Coelho, MD, Richmond, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the factors employed to calculate a frailty index and discuss the utility of employing frailty indices in preoperative care of patients undergoing otologic surgery.

Objectives: Recently, determinants of frailty have become an increasingly recognized perioperative risk stratification tool. This study examines the predictive value of a 5 factor modified frailty index (mFI-5) on perioperative morbidity and mortality in patients undergoing otologic surgery, with a subgroup analysis based on surgery site. Study Design: Retrospective database analysis. Methods: Data from the National Surgical Quality Improvement Program (NSQIP) database between the years of 2005 and 2019 was obtained and filtered to select all otologic cases. A multivariate logistic regression was used to assess the association between mFI-5 scores and complications occurring within 30 days of surgery, with subgroup analysis of “external ear”, “middle ear/mastoid”, “implants”, and “inner ear/facial nerve cases”. Results: A total of 16,859 patients who underwent otologic surgery were identified, resulting in a cohort that was 47.5% male with an average age of 47.6 years (17.1 SD). Multivariable regression analysis of the entire cohort demonstrated a score of 3 or more on the mFI-5 was independently predictive of all postoperative complications (OR: 2.02, $p < .0001$). However, subgroup analysis showed that only “external ear” surgery correlated with mFi-5 (OR 8.03, $p = .013$). Conclusions: Higher frailty scores as measured by the mFI-5 correlate with postoperative morbidity and mortality after otologic surgery, though subgroup analysis reveals an association only with cases performed on the external ear. These findings suggest that for most otologic surgery, the mFI-5 frailty score is not predictive of postoperative complications.

46. Exploratory Analysis of Tinnitus Reported following COVID-19 Vaccination Using the Centers for Disease Control and Prevention’s Vaccine Adverse Event Reporting System

Shivani Ramolia, MPH, New Brunswick, NJ; Christopher C. Tseng, BS, Newark, NJ; Yu-Lan Mary Ying, MD, Newark, NJ; Robert W. Jyung, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss how the CDC VAERS database could be a useful tool for investigating possible trends in the incidence of tinnitus reported following vaccination, clarifying vaccination adverse effects, and improving public health education about the COVID-19 vaccine.

Objectives: Numerous reports of tinnitus following administration of the COVID-19 vaccine are recorded in the Centers for Disease Control and Prevention’s Vaccine Adverse Event Reporting System (VAERS). Investigating possible trends in tinnitus incidence could be a useful tool in clarifying vaccination adverse effects and improving public health education about the COVID-19 vaccine. Study Design: Retrospective database review. Methods: This VAERS data review included de-identified recipients of all COVID-19 vaccine brands that reported symptoms of tinnitus post-administration from the time period of December 16, 2020, to June 18, 2021. Reports specific to tinnitus were extracted then analyzed based on patient demographics and vaccination features. Results: A total of 7,734 self-reported cases of tinnitus following COVID-19 vaccination were collected. 46.6% of reports occurred among patients aged 41-60 years. Females reported tinnitus more often, comprising 59.6%. Most reports originated from California (12.1%) with the least from North Dakota (0.2%). 50.7% of individuals reporting tinnitus received the Pfizer vaccine, 39.8% received Moderna, and 9.3% received Janssen. The median onset of tinnitus was two days post-vaccination. 39.1% of cases indicated office visit due to reported adverse effects, 1.0% reported hospitalization, and 77.8% indicated no recovery as of report time. Conclusions: Evaluation of patient complaints of tinnitus following COVID-19 vaccination is important to assess the incidence of these potential adverse effects. As VAERS records are crowdsourced and self-reported, they are particularly subject to reporting bias and need to be interpreted in the context of well controlled clinical studies. Further research is needed to rigorously examine any potential relationship between tinnitus and COVID-19 vaccination.

47. Hypoglossal Nerve Stimulator Implantation in the Active Duty Military Population: A Survey Assessing Military Readiness and Satisfaction

Matthew T. Ryan, MD, Bethesda, MD; Michael Coulter, MD, San Diego, CA; Douglas Mack, MD, San Antonio, TX; Elizabeth Huuki, BS, Bethesda, MD; Charles A. Riley, MD, Bethesda, MD; Anthony M. Tolisano, MD, Bethesda, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the impact that hypoglossal nerve stimulator implantation has on active duty military personnel regarding their ability to remain in the military on active duty, deploy in a combat setting, and continue to progress through their military career.

Objectives: There is concern that hypoglossal nerve stimulator implantation (HNSI) will result in medical discharge from active duty

(AD) military status due to issues with body armor fitting, the ability to fire a weapon, interference from energy based weapons, and device complications while deployed. We aimed to evaluate the impact of HNSI on military career progression, service member satisfaction, and maintenance of deployment readiness. Study Design: Retrospective observational study. Methods: Telephonic survey of AD HNSI recipients. Results: Fifteen AD service members who underwent HNSI between 2016 and 2021 were identified. Thirteen completed the survey. The mean age was 44.8 years (range 33-61) and all were male. Six (43%) were officers. All patients maintained AD status following HNSI yielding 14.5 person years of continued AD service following HNSI. One soldier (8%) was formally assessed for medical retention and another was transferred from a deployable combat role to a support role. Those who retired after HNSI (n=6) spent an average of 360 (37-1039) days on AD service prior to voluntarily separating, whereas those who currently remain on AD have served for an average of 441 (243-882) days. Two (14%) deployed following HNSI. Seven (54%) felt HNSI did not impact career progression, while two (15%) felt it negatively impacted their career. Ten (77%) would recommend the implant to other AD personnel. Conclusions: The majority of AD HNSI recipients remained on AD following surgery without a negative impact on career progression. Those who have been implanted generally recommend the implant to other AD personnel suffering from obstructive sleep apnea.

48. Abnormal mGluR5 and mGluR1 Expression in the Cochlear Nucleus in the Fragile X Syndrome Mouse Model during the Auditory Critical Period

Hitomi Sakano, MD PhD, Rochester, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand what metabotropic glutamate receptors are and the concept of the auditory critical period.

Objectives: Fragile X syndrome is the most common hereditary cause of autism spectrum disorder and is associated with auditory hypersensitivity. The well studied fmr1 knockout mouse model exhibits auditory seizures. mGluR1, a metabotropic glutamate receptor (mGluR), is abundant in adult cochlear nucleus and mediates excitatory responses. Thus, we sought to characterize the expression patterns of mGluRs in the fmr1 knockout mouse during the auditory critical period (a time when the brainstem undergoes significant change in its neuroplasticity responses to afferent deprivation). Study Design: mRNA levels of all mGluR genes in cochlear nuclei were compared at ages postnatal day 8 (P8, ~critical period) and adult. Protein expression levels were measured at various ages from P8 to adult, and between fmr1 knockout and wildtype. Methods: mRNA and proteins were isolated from cochlear nuclei. Using RNA-seq next generation sequencing, levels of all mGluRs transcripts were compared. Western blotting performed with antibodies to mGluR5 and mGluR1. Results: Although mGluR1 is the most abundant mGluR in the mature cochlear nucleus, mGluR5 is the most abundant receptor expressed in early development. The transition from mGluR5 to mGluR1 expression occurs around the critical period. However, this transition is slightly delayed in the fmr1 knockout mouse. Conclusions: We present novel data that there is a shift from high mGluR5 to mGluR1 expression in the auditory brainstem that occurs during the critical period and delayed in the fmr1 knockout mouse, a model for Fragile X syndrome. This raises important questions about the potential role of mGluRs in the critical period.

49. Defining the Normal Microbiome of the Head and Neck by Subsite

Ruwaa Samarrai, MD, Farmington, CT; Samantha Frank, MD, Farmington, CT; Nehal Navali, BS, Farmington, CT; George Weinstock, PhD, Farmington, CT; Daniel Roberts, MD PhD, Farmington, CT

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the most common microorganisms that inhabit the head and neck sites of tonsils, middle ear, outer ear, larynx, and sinus, during a normal state of health.

Objectives: The objective of this study is to serve as the first study to comprehensively characterize the normal microbiome of the head and neck in order to identify the commensal state and guide future studies related to diseased states and dysbiosis. Study Design: The study is a prospective clinical study. Methods: Approval from our IRB was obtained for this study. Adult patients older than 18 years of age were recruited from our clinic's otolaryngology department and a total of 50 patients were recruited for sample collection of various anatomic sites in the head and neck. Ten samples were collected from each of the following sites: the tonsils, the larynx, the sinus, the middle ear, and the outer ear. Samples were only collected from patients who did not have history of or active disease processes in these sites. Middle ear and larynx samples were collected in the operating room with patients under general anesthesia. Swab specimens were stored in a -80C freezer and subsequently sent to a laboratory for processing and sequencing. Sample processing and Miseq sequencing occurred at the laboratory. Sequencing was completed for bacterial communities by analyzing 16S rRNA genes and for fungal communities by analyzing ITS regions. Analysis of microbial communities include intra and inter sample diversity of each sample. Samples are characterized through richness, evenness, Shannon, and Simpson diversity indices for intra sample diversity. Inter sample diversity will be measured with Bray Curtis. The diversity metrics are calculated at operational taxonomic units (OTUs) and higher taxonomical levels to best characterize the community structure. We test for association of each of these diversity metrics with cohorts and specific sites. Results: The results show that there are specific microorganisms that identify each head and neck site and define that site in a normal state of health. For the tonsils, sinus, larynx, middle ear, and outer ear, specific species of bacteria repeatedly arise in healthy samples that can be defined as the commensal state for these anatomic sites. The results are presented as abundance bar plots to visualize differences in abundance of dominant taxa in the clinical groups. Heat maps are plotted to visualize clustering patterns in the data. Statistical testing is used to

identify significantly different organisms' relative abundance. Conclusions: The head and neck represents a diverse and important site of microbiome study. Understanding the head and neck microbiome in the normal state and defining the commensal bacteria and abundance patterns in healthy patients can help better define and characterize the processes of dysbiosis that result in disease states. This can help guide antimicrobial therapy, limiting adverse effects of antibiotics and controlling resistance.

50. Virtual ENT Mentorship Program

Rishabh Sethia, MD, Columbus, OH; Ryan Bishop, MD, Columbus, OH; Cameron C. Sheehan, MD, Houston, TX; Charles A. Elmaraghy, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the benefits of a hybrid virtual/in-person mentorship model to provide medical students with early exposure to the field of otolaryngology during the COVID-19 pandemic.

Objectives: To provide medical students with early access to the field of otolaryngology during the COVID-19 pandemic. Study Design: Retrospective review. Methods: Each participant in the program was matched with a faculty mentor in the department of otolaryngology. Parallel in-person and virtual curricula were developed to allow for flexibility given the dynamic nature of the pandemic. The in-person pathway involved spending eight hours per month in clinic or the OR with the participant's mentor. The virtual curriculum incorporated both self-directed learning and virtual meetings with the participant's mentor. Subspecialty lectures allowed students to gain an appreciation for the breadth of the field and final presentations allowed students to practice delivering a formal presentation. Surveys were administered to the students before and after the program to assess development. Results: Seventeen students and seventeen faculty mentors completed the program in 2021. At the conclusion, participants had significantly higher confidence scores for clinical performance, knowledge of anatomy, and familiarity with their department of interest. Every respondent found the program to be a valuable experience and 40% of students reported becoming involved in departmental research as a direct result of this program. Conclusions: This virtual mentorship program offers a potential solution to the negative impact of the COVID-19 pandemic on medical training by giving students exposure to their field of interest and creating lasting relationships that prepare students for clinical practice. Applied broadly, this program may serve as a model for different specialties to offer greater flexibility among mentoring relationships.

51. Impact of COVID-19 on the Geographic Trends of the 2021 Otolaryngology Residency Match

Samantha Marie Shave, BS, Newark, NJ; Avneet Randhawa, BS, Newark, NJ (Presenter); Jairan Sadeghi, BHA BSN MSc, Piscataway, NJ; Pablo Llerena, BS, Piscataway, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact of the COVID-19 pandemic on the geographical trends of the otolaryngology residency match.

Objectives: In this study, we investigate how the lack of in-person clinical and professional experiences affected the geographic trends of the otolaryngology residency match of 2021. Study Design: Cross-sectional study. Methods: This cross-sectional analysis utilized the 2016-2021 match data from accredited medical schools. Schools missing match data from any year including number of students matching into otolaryngology and which programs they attended were excluded from this study. Fischer's exact test was conducted to compare differences between 2016-2020 and 2021 cohorts. GraphPad Prism 9.0 (GraphPad Software, San Diego CA) was used to perform statistical tests. Results: A total of 661 residents were identified from the 55 medical schools included in our study. Of these, 593 (89.7%) residents attended a medical school that had a home otolaryngology residency program. Similar rates of students matched at their home program in the 2016-2020 cohort (18.5%) compared to those in the 2021 cohort (18.2%) ($p > 0.05$). The proportion of students who matched into residency programs in their home region (excluding their home program) in the 2016-2020 cohort (37.9%) was not significantly different from the 2021 cohort (33.6%) ($p=0.324$). The proportion of students who matched outside of their home region (43.6%) in 2016-2020 was comparable to that of the 2021 cohort (48.2%) ($p=0.401$). Conclusions: Despite the suspension of in-person opportunities for the 2021 medical school graduates, there was no significant difference in the rate of students matching into their home institution program or a program in their region as compared to match rates from 2016-2020.

52. Evaluation for Presence of SARS-CoV-2 in Laser Plume

Leigh J. Sowerby, MD MHM FRCSC, London, ON Canada; Doug Fraser, MD PhD FRCPC, London, ON Canada; Anthony Nichols, MD FRCSC, London, ON Canada; Corey Moore, MD FRCSC, London, ON Canada; Richard Gibson, MSc, London, ON Canada; Eric Arts, PhD, London, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to better evaluate the risk of SARS-CoV-2 infection from laser plume.

Objectives: Concern has been raised regarding the possibility of SARS-CoV-2 transmission during surgery. One area of concern is that of plume from surgical procedures, and in particular, laser plume. The purpose of this study is to evaluate carbon dioxide

laser plume for the presence of viable SARS-CoV-2 in a porcine model. Study Design: Prospective laboratory basic science study. Methods: In a BSL3 laboratory, a porcine hemilarynx had tissue ablation with a Sharplan carbon dioxide laser for 1 minute after application of SARS-CoV-2. The CO2 laser was used at 1.5W, 7W and 15W in triplicate after application of wildtype SARS-CoV-2, fluorescent SARS-CoV-2 and wildtype SARS-CoV-2 mixed 1:1 with porcine bronchial aspirate to the entire laryngeal surface. Positive controls were collected from the laryngeal surface after laser ablation. Surgical plume was collected onto a gelatin filter and dissolved in DMEM. The collected dilutant was then applied to Vero E6 cells for culture. After 1 week of growth, qRT-PCR, fluoroscopy and mass spectrometry were used to establish presence of SARS-CoV-2. Results: Pending - cultures are cooking. Conclusions: This study has evaluated CO2 laser plume for the presence of viable SARS-CoV-2 after tissue ablation. This information is useful to help mitigate risk in the perioperative setting for laryngeal surgery.

53. Inpatient Otolaryngology Consultations and COVID-19: The Surge and Lasting Effects

Matthew J. Urban, MD, Chicago, IL; Alyssa Calder, BS, Philadelphia, PA; Grant S. Owen, BA, Chicago, IL; Inna Husain, MD, Chicago, IL; Peter C. Revenaugh, MD, Chicago, IL; Pete S. Batra, MD, Chicago, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the lasting effects of the COVID-19 pandemic on inpatient otolaryngology consultations in comparison to pre-COVID levels.

Objectives: COVID-19 changed the landscape of otolaryngology care. According to recent studies, inpatient otolaryngology consultations acutely decreased during COVID-19 surges. This study aims to examine the lasting effects of the COVID-19 pandemic on inpatient otolaryngology consultations. Study Design: Retrospective cohort study. Methods: Inpatient otolaryngology consultations at an urban, academic medical center were reviewed over the course of 2 years (Jun 2019 - Jun 2021). The consults were categorized by time period based on local data for COVID-19 hospitalizations and deaths as follows: pre-COVID (Jun 2019 - Feb 2020), surge 1 (Mar 2020 - May 2020), surge 2 (Oct 2020 - Jan 2021), and late phase (Mar 2021 - Jun 2021). Results: 897 patients undergoing an inpatient otolaryngology consultation across all four time periods were included for analysis. The average consultations per day was 1.67 ± 0.24 in pre-COVID times, and dropped acutely to 0.86 ± 0.33 consults per day during surge 1. This consultation volume was not statistically different from pre-COVID levels during surge 2 (1.33 ± 0.35) and the late phase (1.60 ± 0.20). Reason for consultation and procedures performed did not vary significantly between pre-COVID times and the late phase, except that consultation for postoperative complaint was less frequent in the late phase (4.8% vs 1.0%, p =0.02). More patients had been screened with rapid antigen COVID testing in the late phase versus surge 1 (20.1% vs 7.6%, p = 0.04). Conclusions: Inpatient otolaryngology consultation volumes, indications, and procedures performed returned to pre-COVID levels by the late phase of the pandemic after being significantly impacted during surge 1.

54. Virtual Audiometric Testing Using Smartphone Mobile Applications to Detect Hearing Loss

Lekha V. Yesantharao, BS, Baltimore, MD; Mary Donahue, AuD, Baltimore, MD; Amanda Smith, AuD, Baltimore, MD; Yuri Agrawal, MD MPH, Baltimore, MD

Educational Objective: Few applications have been validated against the gold standard of audiometric testing. Additionally, mobile applications have a high potential for continued use post-pandemic due to the expansion of telehealth in audiology and otology-neurotology. This study addresses the need to establish reliability of existing remote hearing testing platforms. At the conclusion of this presentation, the participants should be able to understand how the hearing screening mobile applications, uHear and Mimi, compare in validity to standard audiometric testing, and also determine potential limitations of the existing technology to drive future research and development.

Objectives: The COVID-19 pandemic drives the need for remote audiometric testing in the form of mobile applications for hearing assessment. The objective of this study is to validate two smartphone based hearing assessment applications, Mimi and uHear, against the gold standard of in-clinic audiometric testing. Study Design: Prospective, cross-sectional study. Methods: 100 patients that presented for hearing assessment were randomly assigned to take either the Mimi or uHear hearing test alongside standard audiometric testing. Hearing thresholds measured using mobile applications were compared to those from audiometric testing to assess validity. Patient satisfaction was measured using a questionnaire that queried if the app met the user's need, if they would recommend the app to others, and how likely they were to use the app again. Results: Using Mimi, there were no significant differences in average hearing levels measured at any frequency when compared to standard audiometric testing. In contrast, uHear overestimated hearing loss at 500Hz and 1000Hz ($p<0.0001$ for both), and underestimated hearing loss at 6000Hz ($p<0.0001$) compared to standard audiometric testing. When stratified by level of hearing impairment, uHear overestimated impairment in those with normal hearing ($p<0.0001$). Overall, Mimi had a higher sensitivity (0.971) and specificity (0.912) than uHear (0.914 and 0.780, respectively). However, uHear significantly outranked Mimi on all three questions in the satisfaction questionnaire ($p=0.0122$, $p=0.0297$, and $p=0.0152$, respectively). Conclusions: Overall, Mimi appears to be a reasonable substitute for standard audiometric testing when individuals are unable to present to clinic for gold standard testing; however, the Mimi user experience can be further improved.

55. Psychometric Predictors of Baseline Resilience in Hearing Loss Patients

Ashley Hyunjung Yi, BS, Los Angeles, CA; Brandon Yeshoua, BS, Los Angeles, CA; Francis Reyes Orozco, BS, Los Angeles, CA; Christine Raj, BS, Los Angeles, CA; Harrison Ma, BS, Los Angeles, CA; Kevin Hur, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact of psychometric factors on the baseline resilience in patients presenting with hearing loss.

Objectives: Lower resilience is linked to worse health outcomes, but there is limited research on what factors influence resilience in hearing loss patients. This study investigates whether the psychometric factors of self-efficacy, quality of life, and subjective social status predict baseline resilience in these patients. Study Design: Cross-sectional study. Methods: Patients with hearing loss presenting to three separate otolaryngology clinics completed surveys collecting sociodemographic information and measures of resilience, self-efficacy, quality of life, and subjective social status. Assessment tools include the Brief Resilience Scale (BRS) with scores ranging from 0 (lowest) to 5 (highest); the General Self-Efficacy Scale; EQ-5D-3L for quality of life; and the MacArthur Scale of Subjective Social Status scaled from 1 (highest) to 10 (lowest). Multivariate linear regression analysis was performed with variables that were significant on univariate analyses. Results: The participating 154 patients (median age 53 years old; 35% male) had a mean BRS score of 3.63. On univariate analyses, BRS score decreased 0.11 with every unit of subjective social status but increased 0.06 with general self-efficacy and 1.56 with quality of life. Male gender was associated with 0.36 increase in BRS score (P value < 0.05 for all). Multivariate analysis found a significant association among general self-efficacy, quality of life, subjective social status, and male gender in predicting BRS scores in hearing loss patients (P value < 0.001). Conclusions: Hearing loss patients with higher measures of self-efficacy, quality of life, and social status had higher baseline resilience. Understanding which factors contribute to resilience may help identify patients who need greater guidance in disease management to prevent worse health outcomes.

56. Factors Associated with Clinic Wait Times in a Multidisciplinary, Academic Outpatient Center

Andrew Yousef, MD, San Diego, CA; David Lauthen, MHA, San Diego, CA; Celia Ramsey, BS, San Diego, CA; Jayna Athas, BS, San Diego, CA; Matthew Jenusaitis, MSE MBA, San Diego, CA; Joseph A. Califano, MD, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to gain a better understanding of what factors are associated with longer wait times and decreased patient satisfaction and how a trainee affects wait times and patient satisfaction.

Objectives: To determine what variables are associated with longer wait times and decreased patient satisfaction and to better understand the effect a trainee has on clinic wait times and patient satisfaction scores in an academic center. Study Design: Cross-sectional study. Methods: We recruited 266 study participants from an interdisciplinary head and neck cancer clinic. Trained students in the clinic observed and recorded wait times, including time waiting, time with providers, and total time spent in clinic. An 11 question survey was given to patients at the end of their visit assessing each patient's satisfaction with their visit and their likelihood to recommend their healthcare provider. Results: Increased wait times were seen in new patients (p=0.006) and with different providers (p<0.001). Patients who saw a trainee spent less time waiting to see a provider (p=0.023) and more total time with a healthcare provider (p=0.001). There was no difference in total time spent in the office if they saw a trainee (p=0.937).140 of the 266 (53%) of patients seen in clinic completed surveys. Patient's subjective wait times were correlated with all other aspects of patient satisfaction (p<0.001) and associated with "likelihood to recommend" scores (p<0.001). Conclusions: Prolonged wait times were associated with several factors including different providers and new patient status. Trainees led to shorter wait times and higher "likelihood to recommend" scores. Subjective wait times were associated with all aspects of patient satisfaction and "likelihood to recommend" scores.

57. Snoring Patterns during Initial Hypoglossal Nerve Stimulation Therapy Up-Titration

Yixuan James Zheng, BA, San Francisco, CA; Yi Cai, MD, San Francisco, CA; Kene-Chukwu Ifeagwu, BS, San Francisco, CA; Jolie Chang, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe potential changes in snoring patterns during hypoglossal nerve stimulation therapy up-titration.

Objectives: To assess snoring in obstructive sleep apnea patients during hypoglossal nerve stimulation (HNS) therapy up-titration using a smartphone application. Study Design: Case series. Methods: HNS patients were asked to use the SnoreLab application upon implant activation. Snoring frequency (percentage of total sleep time) and snore score, a SnoreLab metric incorporating snoring intensity with snoring percentage, were examined using averaged weekly data during the first 3 months. Results: Four patients with an average preoperative AHI of 54.5+/-26.1 were included, with a mean 176 nights of SnoreLab data (73% of nights with Inspire use). Patients demonstrated snore score changes over 3 months compared to baseline. Average snore percentage at baseline was 37%+/-16% and snore score was 49.7+/-29.3. After 3 months, the snoring declined to an average snore percentage 25%+/-26% and snore score 28.0+/-30.1. The average change in HNS voltage settings at 3 months compared to baseline was 1.1+/-0.5 volts. The average time to 30% snore score reduction was 29+/-18 days (range: 15-54) and the average time to 50% reduction was 33+/-16 days (range: 19-55). One patient had rebound snoring during up-titration and took 6.5 months to achieve stable snore score of great-

er than 50% reduction from baseline. Conclusions: Snoring intensity and frequency declined over 3 months during HNS up-titration after activation. Objective snoring metrics may be useful in certain patients to estimate ranges of therapeutic HNS settings during up-titration. Trends in snoring reduction can assist in timing of post-implant sleep study testing.

58. A Multidisciplinary Sleep Apnea Clinic: A Three Year Retrospective Study

Mihai Bentan, Richmond, VA; Thomas Fitzpatrick, MD, Richmond, VA; Nima Vahidi, MD, Richmond, VA; Ryan Nord, MD, Richmond, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the potential value of a truly multidisciplinary sleep apnea clinic whose efficacy is supported by improvements and treatments of patients with obstructive sleep apnea who have failed continuous positive airway pressure therapy.

Objectives: The multidisciplinary sleep apnea clinic (MDSC) simultaneously evaluates patients by ENT, sleep medicine, OMFS and dental sleep. The objective is to review clinical results during the first 43 months of operation. Study Design: Retrospective patient chart review. Methods: A retrospective review of all MDSC patients between February 2018 and September 2021 was performed with IRB approval. All patients had obstructive sleep apnea (OSA) diagnosis and failed continuous positive airway pressure (CPAP) therapy. Results: MDSC evaluated 73 patients with 37.0% having prior sleep apnea surgery and 17.8% having trialed oral appliances. MDSC recommendations included: oral appliance (17.8%), upper airway surgery/stimulation (39.7%), sleep endoscopy (35.9%), CPAP modifications (23.3%), and maxillomandibular advancement (12.3%). 9 (12.3%) patients withdrew before intervention. Of the remaining 64 patients, 26 (40.6%) achieved either a 50% reduction in apnea hypopnea index (AHI) with a post-intervention AHI < 20 or became CPAP compliant. 36 patients failed to meet these criteria: 16.7% were lost to post-intervention followup, 41.7 % required further MDSC specific intervention, 5.6% declined further treatment, 8.3% decreased CPAP tolerance despite intervention, 8.3% underwent bariatrics workup, 13.9% needed post-intervention sleep studies, and 5.6% demonstrated mixed apnea. Of these 36, 11 (17.2%) patients showed post-intervention AHI improvement. Ultimately, 35 patients with post-intervention sleep studies showed an average AHI reduction from 44.8 to 16.0. Conclusions: Over the course of 43 months, the MDSC showed improvements in patient AHI and CPAP compliance. This suggests that a multidisciplinary approach may be efficacious in treating OSA patients with CPAP failures.

59. Department Specific Residency Application Statistics: Their Potential Influence and Impact

Maxwell Bergman, MD, Columbus, OH; Brad deSilva, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to identify difficulties facing prospective applicants when searching for objective otolaryngology program specific information. Participants will understand the rationale for publishing our matched resident application statistics and the data's usefulness and impacted based on a student survey.

Objectives: To provide departmental specific information and application related statistics to students applying to otolaryngology residency. Study Design: Published average matched resident application statistics from 2015-2020 on our department webpage. Information published included categories such as board scores, clinical honors, AOA induction, research involvement, and leadership positions. A REDCap questionnaire was then advertised to assess the information's value. Methods: Survey was opened on 08/2020 to all visitors on our department webpage. The survey asked individuals to 1) identify why they were accessing this information; 2) rate the usefulness of the information in researching our department on a scale 1-5; 3) rate how useful this information would be for other otolaryngology departments on a scale of 1-5; and 4) Indicate if this information influenced their decision to apply to our residency program. Results: We received a total of 42 responses on the survey. 93% of respondents were applying for residency. 83% of respondents found this information very or extremely useful, measured by a score of 4/5 or 5/5. 91% thought that similar information for other residency programs would be very or extremely useful, similarly ranked a 4/5 or 5/5. 60% indicated that this information influenced their decision to apply to our department for residency. Conclusions: Residency applicants value the published data, and it is influencing their decision to apply to our residency program. The vast majority of respondents would find this information useful at other institutions. Based our findings, otolaryngology departments should consider increasing transparency of their own matched resident statistics moving forward.

60. Sinonasal Manifestations of Immunoglobulin G4 Related Disease: A Systematic Review

Shreya Chidarala, BS, Charleston, SC; Tiffany Chen, BA, Charleston, SC; Zachary M. Soler, MD MPH, Charleston, SC; Habib Rizk, MD, Charleston, SC; Rodney J. Schlosser, MD, Charleston, SC; Celine Ward, MD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should better understand the various signs of IgG4 related disease in the sinonasal region with respect to patient demographic factors, comorbidities, location of symptoms and be more equipped to discuss the efficacy of diagnostic methods and treatments.

Objectives: IgG4 related disease (IgG4-RD) is an immune mediated, fibroinflammatory disease often with multi-organ involvement. While IgG4-RD is well studied in salivary glands, thyroid, and orbit, the sinonasal manifestations of IgG4-RD remain undefined. This study is the first to systematically review clinical presentation, diagnostic methods, and treatment outcomes for sinonasal

manifestations of IgG4-RD. This study secondarily aimed to explore the association between IgG4-RD and chronic rhinosinusitis (CRS). Study Design: Systematic review. Methods: Following PRISMA guidelines, PubMed-NCBI, Scopus, Cochrane, CINAHL were queried through September 2021 for studies describing sinonasal IgG4-RD. Case reports were excluded. Pooled data were calculated and presented as N(%) or weighted means. Chi square was conducted. Results: Twenty studies with 166 patients were included. Mean age was 49.2 years, and a male predominance (1.3:1 M:F) was observed. CRS was seen in 49 (25.5%) and signs of atopy (i.e., allergic rhinitis, asthma, or allergy) was seen in 41 (24.7%). The most common symptoms were olfactory dysfunction in 40 (24.1%) and nasal obstruction in 28 (16.9%). The most frequently involved sinonasal location was the paranasal sinuses (51, 30.7%), of which the maxillary sinus (18, 35.3%) was most affected. Concurrent ophthalmologic involvement was seen in 41 (24.7%) patients. Of the 112 patients that underwent biopsy, pre-treatment IgG4 levels averaged 664.2mg/dL (normal, 8-140 mg/dL) and 49 (29.5%) met diagnostic criteria of IgG4/IgG ratio > 0.4. Greater improvement was seen with corticosteroids (23, 63.9%) versus surgery (14, 45.2%) without statistical significance (p=0.53). Conclusions: IgG4-RD may have an association with CRS, but disease interplay and epidemiologic overlap remains unclear. A diagnosis of IgG4-RD should be considered for patients with CRS and extranasal symptoms.

61. Assessing the Impact of Time to Surgery on Postoperative Outcomes and Length of Stay in Adults Undergoing Glossectomy

Hannaan S. Choudhry, BA, Newark, NJ; Mehdi S. Lemdani, BA, Newark, NJ; Hassaam S. Choudhry, BA, Newark, NJ; Christopher C. Tseng, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact of time from hospital admission to surgery on postoperative outcomes and length of stay (LOS) following glossectomy in adults.

Objectives: To investigate the impact of time from hospital admission to surgery on postoperative outcomes and length of stay (LOS) following glossectomy in adults. Study Design: Retrospective database review. Methods: The National Surgical Quality Improvement Program database was queried for patients who underwent primary partial, hemi, subtotal or total glossectomy between 2011-2018. Multivariate analyses were conducted to determine the relationship between time to operation and rates of postoperative life threatening complications, mortality, surgical site infection, adverse discharge, and postoperative LOS. Results: A total of 4,309 patients were included. The mean age was 61.58 years, and the mean time from hospital admission to surgery was 2.93 hours. The majority of patients were male (58.9%), White (72.7%), non-obese (66.4%), and had an ASA class 3 (58.1%). Hypertension requiring medication was the most common comorbidity noted (47.9%). Increased time to surgery (> 0 hours) was a strong predictor for life threatening complications (OR 2.141, 95% CI 1.214-3.776, p=0.009), adverse discharge (OR 2.020, 95% CI 1.202-3.397, p=0.008), and any complication (OR 2.104, 95% CI 1.333-3.320, p 0 hours) effectively predicted a 3.152 day increase in postoperative LOS (95% CI 2.274-4.031, p<0.001). Conclusions: Increased time to surgery appears to increase the risk for life threatening complications, adverse discharge, and longer postoperative stay. These findings can potentially push hospitals and surgeons to minimize operating delays to improve postoperative outcomes and achieve better resource utilization.

62. Evaluating the Impact of Time to Surgery on Postoperative Complications and Length of Stay in Adults Undergoing Total Laryngectomy

Hannaan S. Choudhry, BA, Newark, NJ; Mehdi S. Lemdani, BA, Newark, NJ; Aman M. Patel, BS, Newark, NJ; Christopher C. Tseng, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact of time from admission to surgery on length of stay (LOS) and postoperative complications in adults undergoing a total laryngectomy.

Objectives: To investigate the impact of time from admission to surgery on length of stay (LOS) and postoperative complications in adults undergoing a total laryngectomy. Study Design: Retrospective database review. Methods: The National Surgical Quality Improvement Program database was filtered for patients who underwent primary total laryngectomy between 2010-2018. The association between time to surgery and rates of postoperative LOS, life threatening complications, surgical site infection, adverse discharge, and mortality was evaluated using multivariate analyses. Results: A total of 1,289 patients were included. The mean patient age was 63.37 years. The majority of patients were White (67.5%), male (80.8%), non-obese (72.5%), and had an ASA class 3 (72.5%). The mean time from hospital admission to surgery was 1.15 days. The most prevalent comorbidity was hypertension requiring medication (49.4%). Increased time to surgery (> 0 hours) was not a significant predictor for life threatening complications (OR 1.076, 95% CI 0.642-1.804, p=0.781), surgical site infections (OR 0.825, 95% CI 0.534-1.275, p=0.387) or mortality (OR 0.273, 95% CI 0.030-2.450, p=0.246), but was a significant predictor for adverse discharge (OR 1.624, 95% CI 1.114-2.368, p=0.012). Moreover, increased time to surgery (> 0 hours) corresponded with a 1.516 day increase in postoperative LOS (95% CI 0.289-2.744, p=0.016) as determined by multivariate linear regression. Conclusions: Increased time to surgery in patients undergoing a total laryngectomy is significantly associated with adverse discharge events and prolonged postoperative LOS but not with postoperative medical complications. These results may push hospitals and surgeons to decrease the time from admission to surgery for better postoperative outcomes and resource utilization.

63. The mFI-5 Score Predicts Postoperative Complications and Length of Stay in Adults Undergoing Tonsillectomy
Hannaan S. Choudhry, BA, Newark, NJ; Mehdi S. Lemdani, BA, Newark, NJ; Hassaam S. Choudhry, BA, Newark, NJ; Christopher C. Tseng, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the predictive power of the modified frailty index-5 (mFI-5) for postoperative complications following tonsillectomy.

Objectives: To investigate the predictive power of the modified frailty index-5 (mFI-5) for postoperative complications following tonsillectomy. Study Design: Retrospective database review. Methods: The National Surgical Quality Improvement Program database was queried for patients who underwent tonsillectomy with or without adenoidectomy between 2008-2018. The mFI-5 accounts for five comorbidities and includes diabetes, hypertension, congestive heart failure, chronic obstructive pulmonary disease, and functional status limiting independence. Multivariate analyses assessed mFI-5 score as a predictor for postoperative complications, adverse discharge, mortality, and hospital length of stay. Results: A total of 35,840 patient cases were included. The mean age was 29.82 years and mean mFI-5 score was 0.125. Most patients were female (66.0%), White (66.8%), non-obese (61.7%), and ASA class 2 (52.3%). Hypertension requiring medication was the most common comorbidity (8.6%). The mFI-5 score was a significant predictor for life threatening medical complications (OR 1.915, 95% CI 1.415-2.592, p<0.001), surgical site infections (OR 1.536, 95% CI 1.066-2.214, p=0.021), and any complications (OR 1.701, 95% CI 1.344-2.153, p<0.001), but not for adverse discharge (OR 1.227, 95% CI 0.866-1.737, p=0.250) or mortality (OR 2.676, 95% CI 0.954-7.510, p=0.062). Additionally, multivariate linear regression showed that a 1 point increase in mFI-5 score predicted a 0.091 day increase in total hospital stay (95% CI 0.025-0.157, p=0.007). Conclusions: The mFI-5 score demonstrated utility in strongly predicting risk for life threatening complications, surgical site infections, and increased hospital length of stay following tonsillectomy. Value lies in the ease with which the mFI-5 score can be calculated and then readily implemented in the clinical setting.

64. Impact of Surgeon Specialization on Patient Outcomes for Laryngectomy
David Avery Cohen, BA, Newark, NJ; Dhvani Shihora, BS, Newark, NJ; Aatin K. Dhanda, BA, Newark, NJ; Christopher C. Tseng, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how surgeon specialization and surgical case volume affects outcomes in laryngectomy patients.

Objectives: To investigate outcomes associated with surgeon specialization (SS) and surgical case volume (SCV) in laryngectomy patients. Study Design: Retrospective database analysis. Methods: The 2003-2009 National Inpatient Sample (NIS) was queried for laryngectomy cases. SS was defined as the percentage of cases performed that were laryngectomies and SCV as the total number of laryngectomy cases performed per surgeon per year. Surgeons were further divided into quartiles depending on SS and SCV. Univariate and multivariate analyses were performed. Results: A total of 3,648 laryngectomy cases were identified. The average SS was 4.44% (range: 0.00%-100.0%) and average SCV was 6.27 cases (range: 1-28). Overall in-hospital mortality (1.0% vs. 2.5%, p=0.26) and adverse discharge disposition rates (15.3% vs. 21.0%, p=0.34) were lower for higher SS, though not significantly associated. Moreover, while mortality was not associated with higher SCV (0.9% vs. 1.5%, p=0.37), adverse disposition rates were significantly lower (12.9% vs. 19.8%, p<0.001). On multivariate logistic regression, there was no significant difference in likelihood of in-hospital mortality (p=0.22) or adverse disposition (p=0.17) with SS quartile. However, our results showed significantly decreased odds of adverse disposition (OR 0.60, 95% CI: 0.49-0.75, p<0.001), but not in-hospital mortality (OR 0.59, 95% CI: 0.28-1.24, p=0.16) for the highest SCV quartile compared to the lowest. Conclusions: Based on our findings, increased laryngectomy case volume was significantly associated with lower odds of adverse disposition but was not significantly associated with in-hospital mortality. There was no significant difference in likelihood of mortality or adverse disposition based on surgeon specialization in laryngectomies.

65. WITHDRAWN - Cervical Strain and Impulse during Various Otolaryngology Surgeries
Hannah Daniel, MBA, Lubbock, TX; Rahul Varman, MD, Lubbock, TX

66. Teleotolaryngology by the Numbers: An Analysis of Outpatient Practice during the COVID-19 Pandemic
John Sebastian de Armas, BS, Loma Linda, CA; Ethan Miles, BS, Loma Linda, CA; Michael Reimer, BA, Loma Linda, CA; Kari Roberts, BS, Loma Linda, CA; Chloe Dominguez, BS, Loma Linda, CA; Steve Lee, MD, Loma Linda, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to ascertain potential barriers to the use of telemedicine, ways in which these barriers impact patient care, and be encouraged to identify and mitigate similar barriers in their own patient populations.

Objectives: To examine the use of teleotolaryngology for definable characteristics and potential, previously identified barriers to care, monitoring changes throughout the pandemic. Study Design: Retrospective chart review of all patients seen within the department of otolaryngology at a tertiary care center between April 1, 2020, and August 31, 2021. Methods: Demographic information collected included age, sex, race, ethnicity, zip code, primary/secondary diagnosis, and primary language spoken. Socioeconomic status was

estimated using zip codes via the Social Deprivation Index (SDI) generated by the Robert Graham Center. Results: 4918 patient encounters were identified assessed. On average, patients had an SDI of 66.2 with a median of 72. The mean estimated driving distance avoided by use of telehealth was 37.9 miles. From 2020 to 2021, the proportion of telehealth visits with patients < 30 miles away decreased while this increased in patients > 30 miles away (p=0.026). The average age of telemedicine users was found to be 47.4 with 25% of users above the age of 67.0. The frequency of Hispanic and/or Latino patients who received telehealth care decreased from 2020 to 2021 by 38% (95% CI 0.35, 0.41). Additionally, the proportion of telehealth visits with patients who spoke Spanish as their primary language decreased from 8.2% to 4.6% from 2020 to 2021 (p<0.001). Conclusions: Multiple barriers exist to outpatient patient care delivered through telemedicine such as a large elderly population, low socioeconomic status, and decreasing reach to Spanish speaking populations. However, advantages exist in decreasing driving distance, subsequently facilitating social distancing.

67. Anatomic and Audiometric Outcomes of Porcine Intestinal Submucosa Compared to Autologous Fascia for Tympanic Membrane Repair

Pragnya Dontu, BS, Baltimore, MD; Kevin Shaigany, MD, Annapolis, MD; David J. Eisenman, MD, Baltimore, MD

Educational Objective: At the conclusion of the presentation, the participants should be able to compare the anatomic and audiometric outcomes and efficacy of porcine intestinal submucosa to autologous fascia grafts for tympanic membrane repair.

Objectives: Surgical repair of tympanic membrane perforations has been traditionally performed with autologous soft tissue grafts with high success rates. Newer allografts such as porcine small intestine submucosa (pSIS) have been employed as alternatives to minimize donor morbidity and surgical time, and in cases where autologous tissue may not be available. The comparative anatomic and audiometric success rates of these tissues is still unclear. Study Design: Retrospective case control series of anatomic and audiometric outcomes of fascia versus pSIS graft for primary, isolated transmeatal tympanic membrane repair. Methods: Lumped cohort and matched pairs analysis of all patients undergoing primary transmeatal tympanic membrane repair with autologous fascia or pSIS. Patients with cholesteatoma or retraction pockets, those who had cartilage grafts or ossicular reconstruction, and revision procedures were excluded. Pre- and post-surgery air bone gaps (ABG) and pure tone averages (PTA) were compared. Graft success was defined as closure of the perforation at 2 month followup visit. Results: There was no statistical significance (p<0.05) between the postop ABG, change in ABG, postop PTA, change in PTA, or graft success rate between the two groups with either lumped cohort or matched pairs analysis. Conclusions: Porcine small intestine submucosa grafts are effective for repair of tympanic membrane perforations with hearing outcomes and graft success rates comparable to autologous fascia.

68. Lessons Learned from Inspire Super-Performers

Thomas H. Fitzpatrick IV, MD, Richmond, VA; Pavan S. Krishnan, BS, Richmond, VA; Noah J. Hillerbrand, BS, Richmond, VA; Ryan S. Nord, MD, Richmond, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to recall criteria for patients seeking hypoglossal nerve stimulation, and better understand who might benefit most from this treatment.

Objectives: The purpose of this study is to examine what demographic factors correlate with greater rates of upper airway stimulation adherence and efficacy. Study Design: The study is a case control study, comparing demographic factors for patient groups with different outcomes. Methods: We queried a single surgeon's database of UAS cases, totaling 97 at the time of study. The electronic medical record (EMR) was queried for each patient and pertinent demographics were recorded. We began by defining cohorts: super-adherers were those > 6 hours of nightly device use; non-adherers < 4. Super-responders had a postoperative AHI and ESS < 10, and > 80% decrease in AHI. Non-responders had an AHI > 20 and < 50% decrease. Super-performers met both super-adherer responder criteria, while non-performers similarly met both negative criteria. Results: Overall, 97 patients underwent hypoglossal nerve stimulation with an average AHI reduction of 67.1%, and 6.2 hours of nightly adherence. 11 patients were defined as super-performers, and 3 as non-performers. 20 patients were super responders vs 11 non-responders. 49 were super-adherers vs 34 non-adherers. P values for various categories will be displayed in table 1, no difference was found between the groups as age, BMI, sex, preop AHI, and preop VOTE score were examined. Conclusions: Upper airway stimulation is an effective treatment for patients intolerant of CPAP. In this review, there were no statistically significant differences found between the best and lowest performing patients when evaluating baseline demographic factors.

69. Difference in Quality of Life after Facial Reanimation Surgery between Masseteric Nerve Graft and Alternative Graft Techniques: Systematic Review and Meta-Analysis

Alejandro Garcia, MD, Boston, MA; Jose Rodrigo Foti, MD, Bogota, Colombia

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the differences in quality of life and functional outcomes after masseteric nerve graft compared to other available techniques for facial nerve reanimation.

Objectives: Systematically analyze the differences in quality of life and functional outcomes after masseteric nerve graft compared to other available techniques for facial nerve reanimation. Study Design: Systematic review and meta-analysis. Methods: Literature

review and data extraction search was performed in PubMed, Embase, and Web of Science Core Collection from 1985-2021 following the PRISMA guidelines. Studies included patients with unilateral non-traumatic facial nerve paralysis undergoing free gracilis muscle transfer (FGMT) with masseteric nerve or an alternative graft technique (cross facial, temporalis muscle transposition, other nerve transposition). A random effects model was used due to high heterogeneity comparing outcomes in measures of quality of life, oral commissure excursion and facial symmetry. Results: Total of 601 studies were screened, 16 articles met inclusion criteria and underwent full text review. Data was extracted for a total of 670 patients undergoing masseteric nerve transfer (30%), other graft technique (35%) or both (35%). The mean age was 48 (SD, 19.3) and the most common etiology for facial reanimation was vestibular schwannoma surgery (42.6%). The most common tool (50%) for evaluating quality of life after surgery was the Facial Clinimetric Evaluation (FaCE) questionnaire. Four studies were included in the meta-analysis. The weighted mean difference (WMD) in overall quality of life between masseteric nerve graft and other graft techniques was -0.09 (95%CI, -7.16-6.97). No significant differences were seen in length of oral excursion, facial symmetry at rest or smiling. Conclusions: Overall, there was no significant differences in quality of life or functional outcomes between FGMT with masseteric nerve graft compared to alternative techniques.

70. Analyzing Diversity Elements on Otolaryngology Residency Program Websites

Jamil Hayden, BA, Washington, DC; Randall Harley, BS, Pittsburgh, PA; Nikita Deshpande, BS, Washington, DC; Daniel Swanson, BS, Washington, DC; Alexandra Welschmeyer, BS, Washington, DC; Earl H. Harley, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand how the internet presence of otolaryngology residency programs influences recruitment of diverse applicants.

Objectives: To investigate how the internet presence of otolaryngology residency programs influences recruitment of diverse applicants. Study Design: Retrospective cohort study. Methods: We identified 10 common ways in which residency programs communicate their commitment to diversity through web based platforms. We then analyzed program websites and Instagram pages for the presence of these 10 diversity elements. Univariate and multivariate linear regression were used to evaluate the association between presence of a diversity elements and the proportion of underrepresented minority residents in the program. Results: Review of 106 otolaryngology residency program websites and Instagram pages was completed from February to May 2021. Most programs (69.8%) satisfied at least one diversity element. Of the programs reviewed, 83 had demographic information available for comparison. After adjusting for Doximity ranking, multivariate linear regression demonstrated that several elements were positive predictors of program diversity. Diversity and inclusion message ($p < .0001$), statement encouraging URM applicants ($p < .0001$), dedicated diversity chair/committee ($p = .005$), and diversity related articles/blog posts ($p = .006$) were independently associated with a greater proportion of URM residents in a given program. Conclusions: These data demonstrate that providing diversity related information on residency program websites may play a role in improving program diversity. The large percentage of programs that lack the presence of any diversity element (30.2%) demonstrates that there is significant room for improvement. This study presents a promising strategy through which programs can improve recruitment of diverse residents.

71. The Prevalence of Otolaryngological Disease in an Urban Refugee Population

Katrin Jaradeh, BS, San Francisco, CA; Josephine Czechowicz, MD, San Francisco, CA; Lia Jacobson, MD MS, San Francisco, CA; Alice Tang, BS, San Francisco, CA; Eva Raphael, MD MPH, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participant should be able to describe the prevalence of otolaryngological disease and most common diagnoses in a cohort of refugees compared to non-refugee immigrants and U.S. born patients in an urban setting.

Objectives: Between 2014-2017, the United States admitted 278,630 refugees. Limited data exists regarding otolaryngological (OHNS) disease in this population, and we aim to characterize its prevalence among refugees. Study Design: We performed a retrospective cohort analysis utilizing ICD-9 and ICD-10 codes comparing adult refugees, immigrants, and U.S. born individuals in a primary care clinic, between 2014-2017. Methods: Descriptive statistics describe the prevalence of OHNS disease between groups, stratifying by age and sex. Bivariate and multivariate logistic regression models were conducted to assess differences in prevalence of OHNS disease between groups. Results: Of 995 patients analyzed, 343 were refugees, 450 immigrants, and 202 U.S. born. Immigrants were older (46 years vs 34 years among refugees, 35.5 years among U.S. born, $p<0.001$) and more likely to be women (64% vs 52% among refugees and 56% among U.S. born, $p=0.003$). Among refugees, 27% were Central American, 22% Chinese, and 9.3% Middle Eastern. Hearing loss and allergic rhinitis were the top two diagnoses for all three groups. Refugees were more likely to have at least one OHNS diagnosis (16% vs 14% among immigrants and 6% U.S. born, $p<0.001$). Refugees were more likely to have at least one OHNS diagnosis compared to U.S. born individuals (age and sex adjusted OR 3.40, 95% CI [1.80, 6.95], $p<.001$) and immigrants (age and sex adjusted OR 1.62, [1.05, 2.51], $p = 0.03$). Conclusions: OHNS disease is prevalent among refugees, necessitating ongoing evaluation during the newcomer health screen and identifying barriers to referral and treatment.

72. Telemedicine Use and Healthcare Disparities in Otolaryngology: A Retrospective Cohort Review

Evan S. Kominsky, BA, New York, NY; Brandon S. Gold, BA, New York, NY; Jeeyune Bahk, MD, New York, NY; Christine Little, BA, New York, NY; Alyssa Hackett, MD, New York, NY; Aldo V. Londino III, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the factors associated with a decreased likelihood of telemedicine use and gain a better appreciation of the need to ensure equitable access to telemedicine technology as it increasingly becomes part of modern healthcare delivery systems.

Objectives: To investigate the effect of patient characteristics on the use of telemedicine among otolaryngology outpatients at a diverse, urban hospital system. Study Design: Retrospective cohort study. Methods: All outpatient visits to otolaryngologists at a tertiary referral center between January 1, 2020, and August 27, 2021, were included. Among patients with multiple visits within this period, only the initial visit was included. Demographic data, visit modality (in-person, telephone, or video), insurance status, and median household income by zip code were recorded. Univariate and multivariable analysis were used to compare the telehealth and in-person groups. Results: A total of 63,940 patient visits were identified, with 92.8% in-person and 7.2% via telehealth. Patients seen via telehealth were significantly younger (mean 43.9 +/- 18.7 y vs 47.6 +/- 21.6 y, $p < 0.001$) and proportionally White (43.5% vs 30.8%, $p < 0.001$). Gender did not differ significantly between the groups (56.4% vs 55.1% female, $p = 0.09$). Median household income was significantly higher for the telehealth group ($89,100 ± 39,400 vs $82,900 ± 36,200, $p < 0.001$). Patients with Medicaid and Medicare were less likely to complete a telehealth visit (aOR 0.82, $p < 0.001$ and aOR 0.65, $p < 0.001$, respectively), as were Black and Asian patients (aOR 0.87, $p = 0.005$ and aOR 0.86, $p = 0.027$, respectively). Conclusions: Patients who sought care from an otolaryngologist via telehealth tended to be younger, white, live in a higher socioeconomic area, and were less likely on Medicaid. Care must be taken to ensure equitable access to telemedicine as it increasingly becomes part of modern healthcare delivery systems.

73. Does Surgical Specialty Matter? The Importance of Otolaryngologists Performing Laryngectomy

Keshav D. Kumar, MPH, Newark, NJ; Dhiraj Sibala, BS, Newark, NJ; Vraj P. Shah, BS, Newark, NJ; Amar D. Desai, MPH, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to characterize differences in the postoperative outcomes of laryngectomies performed by otolaryngologists compared to other surgical specialties.

Objectives: Although laryngectomy procedures are primarily performed by otolaryngologists (ENT), they are sometimes performed by surgeons of varying specialties. We seek to characterize differences in the postoperative outcomes of laryngectomies between ENT and other surgical specialties. Study Design: Retrospective study of a national surgical quality database. Methods: The 2005-2018 American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database was queried via CPT codes for patients undergoing laryngectomies. Chi square and logistic regression were performed to determine statistical associations between surgical specialty and laryngectomy complications. Results: Of the 2,889 patients that underwent a laryngectomy, 2692 (93.2%) were treated by ENT and 197 (6.8%) by other specialties, including 111 (3.8%) by general surgeons and 52 (1.8%) by plastic surgeons. Patients treated by ENT were more likely to be male (79.7% vs. 70.6%, p=0.002), smokers (46.9% vs. 38.6%, p=0.023), and have a history of steroid use (4.8% vs. 1.0%, p=0.007). Patients treated by ENT and other specialties had similar odds for postoperative surgical (p=0.207) and overall complications (p=0.963). However, patients treated by ENT were less likely to have postoperative medical complications (OR: 0.388, p=0.037) or require ventilation and intubation (OR: 0.248, p=0.017). Mortality was similar between patients treated by ENT and other specialties (1.6% vs. 1.5%, p=0.967). Conclusions: Although odds for overall and surgical postoperative complications were similar by surgical specialty, patients undergoing laryngectomies were less likely to have medical complications or require ventilation and intubation when treated by ENT compared to other surgical specialties.

74. Rural-Urban Otolaryngologic Observational Workforce Analysis

Frantzlee LaCrete, BS, Omaha, NE; Kendra L. Ratnapradipa, PhD, Omaha, NE; Kristy Carlson, PhD, Omaha, NE; Elizabeth Lyden, MS, Omaha, NE; Jayme Dowdall, MD, Omaha, NE

Educational Objective: At the conclusion of this presentation, the participants should be able to understand 1) statewide rural health disparities regarding access to otolaryngology care; 2) a model to estimate a standardized distance to healthcare facilities; and 3) potential solutions to the issues identified in this study.

Objectives: To analyze the rural-urban access to otolaryngology (ENT) care within a state and to provide a model estimating patient distance to care for otolaryngology that may be extrapolated to other specialties. Study Design: Observational, workforce analysis. Methods: Data sources were the state's health professions tracking system (ENT locations) and 2010 U.S. Census. ENT locations were geocoded and classified as primary or outreach. Counties were classified as levels I (most urban) through VI (most rural) based on the National Center for Health Statistics (NCHS) 2013 County Classification Scheme. Analysis consisted of counts, percentages, means with standard deviation, t-tests and ANOVA. Significance was set at $P < 0.05$. Results: The state has 78 primary and 70 outreach ENT clinics. Thirty-seven ENTs have outreach clinics (5 having a primary clinic in a different state and 32 having in-state primary clinics). This rural state had no level I or II counties and 86% of counties were level V and VI. Using level III as ref-

erence, there were significantly fewer primary ENTs per 100,000 population versus levels IV-VI (2.08 versus 0.57, 2.06, and 0 ENTs, respectively) and significantly longer driving distances to primary clinics (5.17 versus 14.15, 13.05, and 29.94 miles, respectively). Outreach clinics only significantly decreased driving times in level VI counties, 29.94 miles to primary clinic to 9.50 miles to any clinic. Conclusions: There is a significant paucity of ENTs practicing in rural areas of a state. Rural access to care can be augmented by recruitment of future physicians from these rural areas.

75. Do Transferred Patients Undergoing Laryngectomy Have an Increased Likelihood of Postoperative Complications and Outcomes?

Mehdi S. Lemdani, BA, Newark, NJ; Vraj P. Shah, BS, Newark, NJ; Avneet Randhawa, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jordon G. Grube, MD, Albany, NY; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to consider whether transfer status impacts postoperative complications in patients undergoing laryngectomy.

Objectives: Patients transferred in from different entry points of care typically have complex comorbidities and complications that require greater care and medical/surgical management. The impact of patient transfer status has not been examined in patients undergoing a laryngectomy. Our study seeks to understand the impact of transfer status on postoperative outcomes in patients undergoing laryngectomy. Study Design: Retrospective database review. Methods: The National Surgical Quality Improvement Program database was queried for patients with known transfer statuses who underwent laryngectomy between 2011 and 2018. Multivariate analyses were conducted to investigate the association between transfer status and postoperative comorbidities and complications. Results: 2,074 patients were included. The mean age was 62.9 years. The majority of patients were White (64.7%), male (81.1%), and nonobese (54.9%). 140 patients (6.8%) were transferred rather than being directly admitted to the hospital where they underwent surgery. Univariate analysis showed that transferred patients were more likely to experience postoperative extended ventilator dependence ($p < 0.001$), blood transfusion ($p = 0.003$), and any complication ($p < 0.035$). Multivariate analysis controlling for age, race, sex, ASA status, and significant comorbidities associated transfer status with no complications (OR 1.035, 95% CI 0.707 - 1.516, $p = 0.858$), including bleeding (OR 1.430, 95% CI 0.937 - 2.183, $p = 0.098$) and extended ventilator use (OR 2.036, 95% CI 0.895 - 4.631, $p = 0.090$). Conclusions: This study found transfer status did not associate with postoperative complications in patients undergoing laryngectomy. Transferred patients generally have more comorbidities but transfer status does not seem to impact postoperative outcomes.

76. Improving Virtual Otolaryngology Resident Education through Google Classroom: A Pilot Study

Jonathan Liang, MD MPH, Oakland, CA; Peter M. Debbaneh, MD, Oakland, CA (Presenter); Rijul S. Kshirsagar, MD, Philadelphia, PA; Megan Durr, MD, Oakland, CA

Educational Objective: At the conclusion of this presentation, participants should be able to describe how the Google Classroom platform can be incorporated into and improve otolaryngology residency training.

Objectives: The COVID-19 pandemic has changed how educators teach and how students learn. Google Classroom (GC), which has been employed in other educational settings, was implemented for otolaryngology residency curriculum as a strategy to improve education in a virtual setting. We aimed to assess residents' attitudes with the GC platform. Study Design: Matched paired design. Methods: A survey was distributed weekly during an 8 week rhinology curriculum. At weeks 1 and 6, residents were asked about their opinion of GC using a Likert scale (5 point scale). Additional qualitative and quantitative questions were assessed throughout the curriculum. Results: 10/10 residents responded and participated in the pilot GC curriculum. The average week 1 and 6 ratings were 3.7 (SD 0.82) and 4.3 (SD 0.95), respectively; the average change in rating was +0.6 (SD 0.97). Matched paired analysis showed there was increase from weeks 1 to 6 ratings (Wilcoxon signed ranked test, $p = 0.048$). 9/10 residents reported GC enhanced their learning, and 9/10 had greater engagement in learning. Residents, on average, accessed GC 2-3 days out of the week. 9/10 residents strongly recommended use of the platform for future curriculum sessions. Qualitative analysis showed that residents appreciated the reminder features, organization, and all in one location of resources; technological burdens/constraints were the main disadvantages. Conclusions: GC is a novel method to deliver otolaryngology residency education. Our pilot study showed overall positive resident attitudes toward the platform with significant increase after 6 weeks. GC can improve educational delivery and engagement in the virtual learning environment. Residency programs should consider incorporating GC into their current education modules.

77. Impact of Race on Free Flap Surgery of the Head and Neck

Ryan E. Nagy, MD, New Orleans, LA; Adrian A. Ong, MD, Fort Worth, TX (Presenter); Michele M. Carr, DDS MD PhD, Buffalo, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to determine the effect of race on postoperative complications in patients undergoing free flap reconstruction of the head and neck.

Objectives: To assess the impact of race on complications in patients undergoing free flap reconstruction of the head and neck.

Study Design: Retrospective study from the National Surgical Quality Improvement Program (NSQIP). Methods: Data were taken from the NSQIP database for surgical procedures relating to free flap reconstruction of the head and neck using appropriate CPT codes from 2017 to 2019. Complications were initially compared by race. A subanalysis was performed after propensity score matching between those who identify as Caucasian and Black or African American (AA). Results: In total, 1589 patients underwent head and neck free flap surgeries between 2017 and 2019 with 1075 (67.7%) identifying as Caucasian, 94 (5.9%) identifying as AA, 82 (5.2%) identifying as non-Caucasian and non-AA, and 338 (21.3%) with no reported race or unknown. Caucasian patients were significantly older, more likely to have moderate dyspnea, and less likely to require a ventilator preoperatively than non-Caucasian patients. After propensity score matching, there were no significant differences in length of stay (LOS), readmission, and reoperation between patients identifying as Caucasian and patients identifying as AA. Conclusions: Although Caucasian patients were older and more dyspneic preoperatively, race did not appear to impact LOS, readmission or reoperation, suggesting a potential difference in patient selection in those undergoing free flap reconstruction of the head and neck. In this database, AA patients only represented a small proportion of patients undergoing free flap reconstruction of the head and neck.

78. Exposure in Medical School as a Predictor of Referral Patterns to Otolaryngology

Tyler J. Ostrowski, BS, Albany, NY; Hemali A. Shah, BS BA, Albany, NY; Jason Mouzakes, MD, Albany, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to to discuss the potential for referral dissonance between otolaryngologists and other specialists based on the data presented.

Objectives: This study characterizes referral patterns of primary care physicians (PCPs) for conditions treated by both otolaryngologists and other subspecialists based on demographic factors. Study Design: Anonymous web based survey study. Methods: State level medical societies were recruited to distribute a QualtricsXM survey to internists, pediatricians, emergency physicians, and family physicians for various medical procedures or conditions. Minitab and R statistical software were used. Results: Ten societies distributed our survey and 49 surveys were analyzed. No significant referral trends were found based on PCP setting of practice, field of practice, or geographic location. PCPs were more likely (> 65%) to refer patients to otolaryngologists over a competing specialist for ankyloglossia and less likely (< 35%) for Bell's palsy, allergies, chronic cough, dysphagia, sleep apnea, skin cancers, and cleft lip/palate. Vestibular dysfunction (57%), cervical lymph node biopsy (57%), rhinoplasty (51%), and thyroidectomy (53%) were more equivocal. PCPs exposed to otolaryngology in medical school for 3 or fewer days were less likely to refer to an otolaryngologist than those exposed to 2 weeks or greater (OR: 0.617; 95% CI: 0.401, 0.950). Although not significant, point estimates of PCPs with less than 1 week and 2 weeks of exposure, respectively, were also less likely refer to otolaryngologists. Conclusions: PCPs have distinct referral patterns, influenced by exposure to otolaryngology in medical school, for procedures and conditions that otolaryngologists share with other specialists. Our group will work to expand our cohort to better gauge this impact to better address gaps in awareness of the scope of practice of otolaryngologists.

79. Impact of the COVID-19 Pandemic on Otolaryngology Residency Regional Matching Trends

Debbie R. Pan, MD, Durham, NC; Russel R. Kahmke, MD, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate understanding of the changes influencing the otolaryngology residency application process due to the pandemic and discuss geographic matching trends within this field over time.

Objectives: The COVID-19 pandemic introduced many new, adaptive changes to the NRMP residency application and match process for the MD class of 2021. This study aims to characterize the impact of the pandemic on trends in home or regional matches among otolaryngology residency programs. Study Design: Cross-sectional study. Methods: All ACGME accredited otolaryngology programs in the US with self-reported information on the medical schools attended by their current residents were included. Educational data was collected over six match cycles (graduating resident classes of 2021-2026) and categorized by US regions. Results: Of 95 eligible programs, a total of 1616 residents were identified. Overall, 22.3% of applicants matched into home programs and 57.6% matched into home regions with the largest proportion of regional matches occurring in the South (64.0%). Across all regions (Northeast, Midwest, West, South), students were more likely to have attended medical school in the same region as their matched program compared to applicants who matched outside that region (OR 9.95, 6.96, 9.65, 6.49, respectively; $P < 0.0001$). While there was no statistically significant change between the proportion of regional matches between each cycle, there was an increase in home matching only noted between the residency graduating class of 2026 and 2025 (30.9% vs 20.9%; $P = 0.0065$). There was no significant association between rate of home or regional matches with the Doximity reputation ranking of residency programs. Conclusions: Examining geographic trends in otolaryngology matching, especially in the setting of changes likely influenced by the pandemic, is valuable to better inform future applicants and programs.

80. Fusobacterium Infections: A Case Series and Review of the Literature

Ashley F. Schemel, MD, Portsmouth, VA; Thomas McDonald, MD, Portsmouth, VA; Charles Meyer, MD, Portsmouth, VA; Craig Folsom, MD, Portsmouth, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the various presentations

of fusobacterium infections as well as the various ways to appropriately treat these infections.

Objectives: Review literature regarding fusobacterium infections, various treatment, and epidemiology in addition to presentation of a case series of fusobacterium infections. Study Design: A report of two cases in addition to a literature review regarding fusobacterium infections over the past 20 years to include natural history, epidemiology, spectrum of infection, and treatment protocols. Methods: A formal scoping review of the literature, to include a Medline search of Lemierre's syndrome in addition to various spellings of the disease. Articles were removed if there was no English translation. Results: Lemierre's syndrome, first described by Andre Lemierre in 1936, is characterized by a history of recent oropharyngeal infection, clinic or radiological evidence of internal jugular vein thrombosis, and isolation of anaerobic pathogens, mainly fusobacterium necrophorum. Patients are typically in the second decade of life and healthy males. Most commonly presenting with fever, but other associated symptoms can include throat pain, neck pain, or neck mass. The most common bacterial culprit is fusobacterium, a heterogenous group of gram negative, non-sport forming rods, with approximately 13 species inhabiting the oral, GI, upper respiratory tract, and vaginal mucosa. F. nucleatum and F. necrophorum are the most commonly isolated pathogens within this genus with a wide range of reported mortality. Previously more widespread, the introduction of antibiotics in the 1940s, specifically for pharyngitis, has decreased incidence of Lemierre's syndrome. This collection of symptoms has fallen to such a degree that is now commonly referenced as the "forgotten disease". Conclusions: Fusobacterium is commonly present within the enteral tract of the average person, but because of the treatment of pharyngitis with antibiotics, has a decreased probability of progressing to classic Lemierre's syndrome. The two cases presented will demonstrate different presentations and stages of fusobacterium infections as well as the various treatment algorithms.

81. Racial Disparities in Laryngectomy Outcomes: A National Perspective

Dhiraj Sibala, BS, Newark, NJ; Keshav D. Kumar, MPH, Newark, NJ; Vraj P. Shah, BS, Newark, NJ; Amar D. Desai, MPH, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to characterize differences in the management and outcomes of laryngectomies based on patient race.

Objectives: There is sparse literature discussing the impact of patient race on postoperative outcomes of laryngectomy. In this study, we seek to characterize differences in the management and outcomes of laryngectomies based on patient race. Study Design: Retrospective study of a national surgical quality database. Methods: The 2005-2018 American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database was queried via CPT codes for patients undergoing laryngectomies. Chi square and multivariable logistic regression were used to determine statistical associations between patients of Black and White race. Results: Of the 2,508 patients who underwent a laryngectomy, 401 (16.0%) were Black, 1887 (75.2%) were White, and 220 (8.8%) were of another race. Black patients were more likely than White patients to be younger than 60 years old (45.1% vs. 36.7%, p=0.002). Patient gender was similar between Black and White patients (p=0.474). Although Black and White patients had similar odds for postoperative medical complications (OR: 1.110, p=0.522), Black patients were more likely to have surgical complications (OR: 1.525, p<0.001) and overall complications (OR: 1.480, p<0.001). Specifically, Black patients were especially far more likely to have significant postoperative bleeding (OR: 1.956, p<0.001). Conclusions: In a cohort of patients undergoing laryngectomy, we report racial disparities in postoperative outcomes. Black patients were more likely than White patients to have surgical and overall complications.

82. Racial Disparities in Head and Neck Free Flap Surgery - A NSQIP Study

Priyanka Singh, BA, Newark, NJ; Simran Ohri, BS, Newark, NJ; Chan Park, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the impact of race and ethnicity on 30 day complications of head and neck free flap surgery.

Objectives: To assess the impact of race and ethnicity on 30 day complications following head and neck free flap surgery. Study Design: Cross-sectional cohort study. Methods: All cases of head and neck free flap procedures from 2005-2018 were queried from the National Surgical Quality Improvement Program (NSQIP) database. Demographics, comorbidities, and postoperative complications between race/ethnicity cohorts were compared using univariate and binary logistic regression analyses. Results: A total of 2,034 cases were included, consisting of 86.6% White, 6.2% Black, 2.7% Asian, 2.7% Hispanic, 0.4% American Indian/Alaska Native, and 1.4% Other. American Indian/Alaska Native patients had increased rates of diabetes (P=.037), steroid use (P=.035), recent weight loss (P=.004), and recent operation (P<0.001). Black patients had increased rates of smoking (P<0.001), disseminated cancer (P=.019), recent weight loss (P=.004), systemic sepsis (P=.036), and ASA 4 status (P=.021). Hispanic patients had increased rates of systemic sepsis (P=.036), and recent operation (P<0.001). Hispanic patients had increased rates of postoperative pneumonia (P=.001). Black and American Indian/Alaska Native patients had increased rates of bleeding complications (P<0.001) and overall surgical complications (P=.002). Black, American Indian/Alaska Native, and Hispanic patients had greater rates of all complications compared to White and Asian patients (P=.013). After adjusting for age and comorbidities, binary logistic regression indicated that Asian patients had increased rates of postoperative bleeding complications (P=.035, [OR]=3.350). Conclusions: Asian race may be an independent predictor of increased bleeding complications in head and neck free flap surgery. Further research and a larger sample size is needed to understand the role of racial disparities in head and neck free flap surgeries.

83. Incidence of Neoplasm in Patients Referred for Epistaxis

Nicholas Toomey, BA, Boston, MA; Tania Hassanzadeh, MD, Boston, MA; David O'Neil Danis, MD, Boston, MA; Jeremiah Tracy, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to to understand the association between epistaxis and neoplastic disease.

Objectives: Primary objective was to identify the incidence of neoplastic disease in patients referred for epistaxis. Secondary objectives included identification of any mass lesion and the need for further workup with imaging and/or biopsy, as well as risk factors associated with identification of a mass lesion. Study Design: Retrospective cohort study. Methods: We reviewed charts of adult patients who presented over an 11 year period (2010-2021) with a chief complaint of epistaxis. The primary outcome was identification of a nasal or nasopharyngeal neoplasm. Secondary outcomes include age, sex, race, smoking status, anticoagulant medication, comorbidities (HTN, allergic rhinitis, vasculitis), and treatment of epistaxis (used as surrogate for severity of epistaxis). Results: 1,654 patients presented with epistaxis and met inclusion and exclusion criteria. Thirty-six nasal masses were found among patients presenting with epistaxis (3.09% $P < .001$), comprised primarily of benign etiology (1.87%) including nasal polyposis and Thornwaldt cyst. Asian race correlated with finding of mass lesion (75% $P = .007$). Five malignancies were found (0.30%) including nasopharyngeal carcinoma (2 patients), extranodal NK T cell lymphoma (2 patients), nasal adenocarcinoma (1 patient). Conclusions: Epistaxis is a common cause for referral to an otolaryngologist. Although the incidence of malignancy in our patient population was low, nasal mass lesions warranting further workup were identified in 36 patients. Findings of neoplasm were more common in patients of Asian ethnicity, which may be a reflection of the increased prevalence of nasopharyngeal carcinoma in this population. Therefore, it is important that patients with recurrent epistaxis are evaluated by an otolaryngologist and undergo nasal endoscopy.

84. Systematic Review of Malignancy Risk of Head and Neck Lesions and Masses

Ziyang Li, BSA, Lubbock, TX; Archana M. Varman, Meng, Omaha, NE; Benjamin Daines, BS, Lubbock, TX; Rahul M. Varman, MD, Lubbock, TX; Tam Nguyen, MD, Lubbock, TX; Joehassin Cordero, MD, Lubbock, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to relatively report malignancy risk of common lesions and masses in head and neck area.

Objectives: To characterize malignancy risk/percentages of lesions and masses in head and neck region to help clinician with patient counseling and decision making. Study Design: Quantitative systematic review. Methods: PubMed, Embase, Cochrane was searched for publications that reported histological classification of biopsied lesions and masses in head and neck region. Limit of studies from 2000-2020. Results: We identified 31 representative studies. Studies reporting malignancy percent were split into subsites. Frequency malignancy risk ranged from 1% to 45%. Percentage risk of malignancy are reported based on subsite. Conclusions: Understanding of malignancy risk helps clinician both counsel patients and make appropriate clinical decisions. We report in a standardized form malignancy potentials of lesions and masses in various areas of head and neck to guide in the clinical setting.

85. Female Representation in U.S. Otolaryngology Faculty

Esther Wang, BS, Chicago, IL; Ashley Diaz, BS, Chicago, IL; Maha Latif Khan, Chicago, IL; Elizabeth Astin Blair, MD, Chicago, IL; Andrea Nath Shogan, MD, Chicago, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that, though the gender gap is narrowing at the assistant professorship level, female representation is still lacking at more senior academic ranks.

Objectives: Despite increasing female representation in the pipeline set to enter the otolaryngology workforce in the next few years, women still comprise a smaller proportion of academic senior faculty. This study aims to quantify the current proportion of women in otolaryngology in the United States at different levels of professorship. Study Design: Cross-sectional analysis. Methods: A comprehensive list of Accreditation Council for Graduate Medical Education accredited otolaryngology programs (2020 to 2021) was compiled. Academic rank was determined from departmental websites, with Doximity and LinkedIn used as complementary resources. Results: Among the 2682 faculty positions at 124 ACGME accredited programs, women held 706 (26.3%) of these positions. Out of 415 instructor positions, women held 113 (27.2%). Female representation was highest at the assistant professorship level, with women holding 286 (37.2%) positions out of a total of 769. At the associate professorship level, women held 141 (27.6%) of the 511 total positions. Finally, the largest gender disparity is seen at the full professorship level; only 69 (13.6%) positions out of 508 were held by women. Conclusions: Otolaryngology has exhibited great progress in gender parity over the last two decades. However, the gender gap at the faculty level still leaves much to be desired, particularly in senior ranks. The lack of otolaryngologists at senior ranks is detrimental to the mentorship of junior faculty and residents, and the recruitment of medical students to the field. Renewed and added efforts should be made to expose medical students to otolaryngology and to understand and decrease the gender disparity at the full professorship level.

86. Infratemporal Fossa Abscesses: A Systematic Review of the Literature

Kurtis C. Young, BS, Honolulu, HI; Dennis Mansfield Tang, MD, Los Angeles, CA; Arthur Wu, MD, Los Angeles, CA

Educational Objective: To develop a better characterization of infratemporal fossa abscesses (IFA).

Objectives: Here, we have attempted to characterize five major domains of IFA including: 1) general characteristics, 2) risk factors, 3) diagnosis, 4) microbiology and antibiotics, and 5) treatment and outcomes. Study Design: Systematic review. Methods: An extensive systematic search was performed through several reputable databases, yielding the initial list of studies. After the removal of duplicate studies, two authors screened out studies by abstracts, and a third resolved any conflicts. The remaining studies were assessed by full text assessment, leaving 43 studies that were subsequently analyzed for data extraction. Results: Sixty-seven patients were included from the final 43 studies. The patients were predominantly male (56.7%), and the average age of patients was 44.3 years (standard deviation (SD) 19.8 years). Risk factors most commonly odontogenic, whether the etiology was through tooth extraction (n=30, 44.8%) or infection (n=17, 25.4%). Symptoms on presentation included pain (n=40, 83.3%), swelling (n=39, 81.3%), and trismus (n=36, 75.0%). Twenty-two (32.8%) patients were managed with intraoral incision and drainage (I&D), 18 (26.9%) with extraoral I&D. After treatment, 45 of the 48 (93.8%) patients from the case reports and series were deemed to have achieved complete resolution. Conclusions: Here, we present the first systematic review of infratemporal abscesses. Future research should focus on expanding what we have highlighted in the present study.

87. Nasal Port for the Reduction of Aerosol Transmission during Nasal and Skull Base Surgery

Dylan C. Zerjav, BS, Hanover, NH; Yuan Shi, BE, Hanover, NH; Michael T. Sramek, BS, Hanover, NH; Torri E. Lee, BA, Hanover, NH; Ryan J. Halter, PhD, Hanover, NH; Joseph A. Paydarfar, MD, Lebanon, NH

Educational Objective: At the conclusion of this presentation, the participants should be able to describe a novel nasal vacuum chamber that minimizes aerosol generation during endoscopic sinus and skull base procedures.

Objectives: Endoscopic sinus and skull base surgery generates aerosolized particles that may increase exposure risk to operating room personnel. We developed a 3D printed, vacuum assisted chamber that envelops a patient's nose to reduce aerosol transmission during surgery without interfering with standard endoscopic technique. Study Design: Medical device design and prototyping. Methods: We designed the device using Solidworks (Dassault Systemes) and a 3D scanned face as a scaffold. The ergonomics of the device were optimized using an iterative design process which integrated feedback from surgeons. The function of the ultimate design was tested in silica using Solidworks Flow Simulator with physiologic parameters. We then conducted an ex vivo study by analyzing the distribution of an aerosolized fluorescent probe that escaped the device under simulated conditions. Results: The device is a 3D printed enclosure made of durable resin with a moldable biocompatible silicone gasket along its perimeter. It has an imbedded vacuum channel encircling the nostrils and entry ports and a standard suction attachment. The device allowed adequate endoscopic access to the nasal cavity with minimal impedance to surgical workflow. In silico, the nasal port captured all of the simulated aerosolized particles generated with an initial escape velocity of 4.5 m/s -- sneezing velocity. Ex vivo, the nasal port reduced the aerosol exposed area by 74.6% compared to exposure without the device. Conclusions: The nasal port device can reduce aerosol transmission generated by endoscopic sinus and skull base surgery and potentially reduce the risk of harmful exposures to healthcare providers.

88. Minimizing Thermal Damage during Thulium Laser Assisted Partial Arytenoidectomy: Pulsed Versus Continuous Cutting in an ex vivo Calf Model

Erica Storm Barnett, BS, Boston, MA; Phillip R. Purnell, MD PhD, Boston, MA; James T. Heaton, PhD, Boston, MA; Robert H. Petrillo, BS, Boston, MA; James A. Burns, MD, Boston, MA

Educational Objective: At the conclusion of this work, participants should be able to demonstrate the effects of thulium laser pulsed transcartilaginous cuts compared to the standard continuous wave cuts used clinically.

Objectives: The 2 μm wavelength thulium laser is an effective cutter during partial arytenoidectomy, but thermal trauma can damage laryngeal tissue. Pulsing the laser energy allows surrounding tissue to cool between pulses, potentially reducing thermal trauma when compared to continuous wave cutting. This study measured temperature changes, thermal trauma, and time to complete partial arytenoidectomy, with and without pulsing, in an ex vivo calf model. Study Design: Bench research utilizing ex vivo calf model. Methods: Time to complete partial arytenoidectomy incorporating transverse cuts through the vocal process was measured on ex vivo calf vocal folds (N=24) using a thulium laser set in continuous wave (CW, N=12) and pulsed wave (PW, N=12) modes. Energy was 5 watts for CW and PW cuts; pulse widths were 250ms, 500ms and 750ms. Tissue temperature was measured with a thermistor implanted 3mm from the cut near the vocal process tip. Thermal damage was analyzed histologically by measuring the depth of lactate dehydrogenase inactivation perpendicular to the laser cut edge at the vocal process. Paired t-tests compared CW and PW modes. Results: Transcartilaginous cuts were completed faster using CW (37sec) compared to PW (250ms=136sec; 500ms=61sec; 750=44sec; $p<.05$), and both modes delivering the same total joules. Change in temperature was lower using CW (6.5°F) compared to PW modes (250ms= 18°; 500ms= 16°; 750= 19°; $p<.05$). Thermal damage may be greater for CW versus PW cutting. Conclusions: Pulsed thulium laser cuts cause less thermal damage but take longer to complete and generate higher peak

temperatures as compared to continuous wave cutting during partial arytenoidectomy. Optimal thulium laser parameters achieve efficient cutting with minimal thermal damage.

89. Profile of Injured Singers: Expectations and Insights

Lesley F. Childs, MD, Dallas, TX; Ashwin Rao, BA, Dallas, TX; Ted Mau, MD PhD, Dallas, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to understand factors associated with the distribution of phonotraumatic lesion types in singers.

Objectives: To discover patterns of phonotraumatic lesions in singers and investigate factors that differentiate those who underwent surgery from those who did not. We hypothesized that 1) lesion type distribution differs by age, sex, singer classification (professional/amateur), and history of formal voice training; and 2) the likelihood of surgery is associated with singer classification and voice training. Study Design: Retrospective. Methods: Retrospective review of 438 singers with phonotraumatic lesions over a 9 year period. Lesion type distribution was analyzed with respect to sex, age, singer classification, and voice training. The association of eventual surgery with these factors was also analyzed. Results: Nodules accounted for over half of the cohort (58%), followed by pseudocysts (20%), polyps (14%), and cysts (4%). Nearly 2 of every 3 injured female singers, but fewer than 1 out of every 3 injured male singers, had nodules. In contrast, over half of the injured males had polyps, whereas only 6% of injured females had polyps. In females, polyps occurred at a later age, and in males, nodules occurred at a younger age compared to other lesion types. Only 14% of the total cohort eventually underwent surgery. Professional singers without formal voice training were almost 8 times more likely to have undergone surgery than amateur singers with voice training. Conclusions: Professional singers were more likely to undergo surgery than amateurs, and formal voice training was associated with a lower likelihood of surgery. The observation that polyps tended to occur in older women may have implications for the pathogenesis of vocal fold polyps.

90. The Impact of Intersectionality by Race and Gender in the Otolaryngology Match in the United States 2013 to 2019

Sherise Epstein, MD MPH, Seattle, WA; Neeraja Konuthula, MD, Seattle, WA; Randall Bly, MD, Seattle, WA; Sarah Bowe, MD EdM, San Antonio, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to describe how the gender and race of the applicant pool was dissimilar to the matched resident pool in the U.S. otolaryngology match from 2013 to 2019.

Objectives: Racial and gender disparities in the otolaryngology match have been described individually, but not intersectionally. Intersectionality recognizes how multiple forms of discrimination (e.g., sexism, racism) can have a combined effect. The objective of this study was to analyze racial and gender disparities in the otolaryngology match using an intersectional approach. Study Design: Cross-sectional evaluation of data on otolaryngology applicants from the Electronic Residency Application Service (ERAS) and data on matched residents from the Accreditation Council for Graduate Medical Education (ACGME) from 2013 to 2019. Methods: The sample was stratified by race and gender. T-tests were used to compare the mean proportions of applicants to matched residents. Results: There was a larger proportion of white males in the matched resident pool compared to the applicant pool (ACGME 0.42, ERAS 0.37, p=0.007, Δ0.05, CI 0.015, 0.071). This was not the case for white females (ACGME 0.21, ERAS 0.18, p=0.053, Δ-0.03, CI -0.001, 0.061). In contrast, there was a smaller proportion of matched residents to applicants among multiracial males (ACGME 0.01, ERAS 0.05, p<0.001, Δ-0.04, CI -0.048, -0.021) and multiracial females (ACGME 0.01, ERAS 0.03, p=0.002, Δ-0.02, CI -0.026, -0.008). Conclusions: In summary, white males were accepted at a higher rate than other racial and gender groups who applied and matched to otolaryngology. This was not observed among white females. In contrast, there was disproportionate underrepresentation of multiracial males and females. These findings imply that inequities in the residency selection process are intersectional and must be taken into consideration when planning initiatives to increase diversity within the otolaryngology workforce.

91. Identification of Features Perceived as Diverse in Otolaryngology Residency Applications Using a Machine Learning Based Approach

Randall J. Harley, BS, Pittsburgh, PA; Sarah C. Shearer, MD, Washington, DC; Jamil A. Hayden, BA, Washington, DC; Selena E. Briggs, MD PhD MBA FACS, Washington, DC; Earl H. Harley, MD, Washington, DC; Michael Hoa, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should have a better understanding of what content within residency applications influences reviewer's perceptions of applicant diversity.

Objectives: To explore features present in an otolaryngology residency application that lead reviewers to perceive an applicant as diverse. Study Design: Cohort study of residency applications to the otolaryngology residency program of a tertiary referral center. Methods: Authors created a diversity term dictionary with words and phrases that broadly capture content related to 9 categories of diversity. Python software within Jupyter Notebook was used to match diversity terms in residency applications and quantify presence of these terms as binary variables (present or absent). Two independent raters reviewed 30 residency applications and scored applicants as diverse or not diverse. Logistic regression was used to determine if applications with diversity terms were more likely to be perceived as coming from diverse applicants. Results: Raters had good interrater agreement regarding perceived applicant

diversity (Cohen's Kappa 0.84, p<.001). Of the 9 diversity term categories analyzed, only URM organization was significantly associated with a higher likelihood to be perceived as diverse by both raters (odds ratio [OR] 26, p=.022 and OR 54, p=.012). Total number of diversity term categories present in an application was not significantly associated with rater perceived applicant diversity (OR 2.04, p=.138; OR 1.42, p=.474). Conclusions: Our data suggest that membership within a URM organization may positively influence a reviewer's perceptions regarding an applicant's racial/ethnic diversity. As otolaryngologists strive to improve diversity in the field, it is important to understand what features within residency applications convey a perception of diversity and whether our current application process empowers applicants to illustrate the diversity they offer.

92. Association between the Modified 5 Item Frailty Index and Complications following Thyroidectomy

Mohammad A. Hossain, BS, Newark, NJ; Nikhit Kethidi, BA, Newark, NJ; Sudeepti Vedula, BS, Newark, NJ; Richard Chan Park, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to identify differences in demographic and clinical characteristics of patients with varying degrees of frailty undergoing thyroidectomy and assess the value of the 5 item modified frailty index in predicting complications following thyroidectomy.

Objectives: The 5 item modified frailty index (mFI-5) has been shown to be an effective predictor of morbidity and mortality across several surgical specialties. Our study aims to assess the effectiveness of the mFI-5 in predicting short term outcomes following thyroidectomy. Study Design: Retrospective database study. Methods: The National Surgical Quality Improvement Program (NSQIP) database was queried for all patients undergoing thyroidectomy between 2014 and 2018. mFI-5 scores were calculated based on the presence of diabetes, chronic obstructive pulmonary disease, congestive heart failure, chronic hypertension, and/or dependent functional status. Univariate and multivariate analyses were conducted to assess demographic, clinical, and surgical differences between patients with lower and higher mFI-5 scores. Results: Of 17,388 patients, 7,366 (42.4%) were characterized as higher frailty (mFI-5 ≥ 2). On univariate analysis, there were significant differences in gender, age, race, BMI, smoking status, dialysis status, steroid use for chronic condition, disseminated cancer, and ASA classification (p<0.001). On multivariate analysis, higher mFI-5 scores were significantly associated with longer hospital stay (OR [95% CI] = 1.223 [1.092-1.369], p<0.001), 30 day mortality (2.360 [1.01-5.514], p = 0.047), having a medical complication (1.613 [1.216-2.138], p=0.001), and being discharged to a destination other than home (1.796 [1.266-2.547], p =0.001). Conclusions: The 5 item modified frailty index can be an independent predictor of perioperative outcomes following thyroidectomy. Higher frailty scores are associated with greater odds of mortality, longer hospital stay, and medical complications but not surgical complications.

93. Trends in Hosting Virtual Platforms by Otolaryngology Programs during COVID-19

Sophie S. Jang, MD, La Jolla, CA; Eric Y. Du, BS, San Diego, CA; Jeffrey D. Bernstein, MD, San Diego, CA; Deborah Watson, MD, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants will be more knowledgeable about the various virtual platforms offered by otolaryngology programs and the long term implications of an affordable alternative to in-person rotations.

Objectives: To survey the virtual platforms hosted by otolaryngology (OHNS) programs for medical student outreach and to analyze trends in program adaptation. Study Design: Retrospective cross-sectional analysis and scoping review. Methods: All announcements by OHNS programs for virtual experiences on Otomatch.com were recorded for the 2021 and 2022 residency application cycles. Each announcement was cross-referenced with the program's website. A review of current literature regarding virtual outreach practices was performed. Results: The number of virtual sub-internships (VSI) offered was similar in 2021 and 2022 (n=8; n=7). The duration of the VSI curriculum was 2 to 4 weeks (n=4, n=3, respectively). Educational webinars were hosted by three programs in both years. Virtual open houses were hosted by n=68 in 2021 (142 events, 2.1 average events per session) and n=68 in 2022 (88 events, 1.7 average events per session). Date of events in the 2021 showed a bimodal distribution with peaks immediately prior and after ERAS application release date. Date of events in the 2022 cycle showed a unimodal distribution prior to ERAS application release date. Seven new programs hosted events in 2021 and 26 discontinued events. Programs adopting virtual events in 2021 had resident class size of Γëñ3 per year. Continued virtual platform participation was more frequent for programs with large class sizes (4 residents/year: 19/26 (73.1%); 5 residents/year: 13/15 (86.7%); 6 residents/year: 1/1 (100%). Conclusions: Since 2021, more OHNS programs are using virtual platforms for student outreach. Virtual formats will continue to contribute to program accessibility and affordability for OHNS applicants.

94. Disclosure of Industry Relationships by Otolaryngologists

Madeline M. Nottoli, BA, Irvine, CA; Sina J. Torabi, MD, Irvine, CA; Khodayar Goshtasbi, MD, Irvine, CA; Yarah M. Haidar, MD, Irvine, CA; Tjoson Tjoa, MD, Irvine, CA; Edward C. Kuan, MD, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the considerable amount of underreporting of relevant conflicts of interest within the field of otolaryngology.

Objectives: This study aims to characterize how often otolaryngologists receiving the largest payments from industry disclose pay-

ments in publications where they are considered relevant, as well as to identify characteristics of these industry relationships. Study Design: Cross-sectional database and bibliometric analysis. Methods: Publications by the 10 highest compensated otolaryngologists from 12 representative medical device and drug companies in 2018 were assessed for disclosure of these potential conflicts of interest in the year following payment (2019). Results: After excluding 52 physicians who did not publish in 2019, 68 individuals received a combined $1,355,918.02 in 2018, with an individual median of 12 payments (IQR=17.5) and median compensation of $10,062.54 (IQR=$14,391.37) from one or more of the 12 companies that were analyzed. The mean number of publications per author in 2019 was 6.2 ± 5.7, and the mean h-index of the authors was 24.2 ± 15.9. Of 549 publications, 15 were classified as relevant, either because the study involved evaluation of a device manufactured by one of the analyzed companies, or because one of the companies funded the study. Of these, 5 (33%) were missing personal disclosure by the author. Of the physicians analyzed, the most represented subspecialty was rhinology (n=35, 51.5%) followed by otology/neurotology (n=11, 16.2%). Conclusions: Though most publications following payments in 2018 from device companies were not deemed to have potential conflicts of interest, a notable proportion of those with authors who received relevant payments lacked financial disclosure. As transparency of relevant industry relationships has received increased attention, appropriate disclosure is recommended.

95. Laryngeal Manifestation of Cutaneous T-Cell Lymphoma: Case Report and Literature Review

Phillip A. Nulty, MD, Detroit, MI; Marwan Boulis, MD, Detroit, MI; Christie L. Morgan, MD, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be familiar with the basic pathophysiology and clinical presentation of the rare disease of cutaneous T-cell lymphoma. They should also be able to recognize mucosal involvement of cutaneous T-cell lymphoma. Participants will gain appreciation for the exceedingly rare case of oropharyngeal and laryngeal mycosis fungoides, and will be able to apply knowledge gained from this case toward clinical practice.

Objectives: Describe an exceedingly rare case of oropharyngeal and laryngeal mycosis fungoides. Study Design: The clinical case of a single patient was observed and reported. Methods: A comprehensive literature review was performed in regard to laryngeal manifestations of cutaneous T-cell lymphoma (CTCL). Findings were summarized and reported along with the clinical course of an observed case of laryngeal CTCL. Results: CTCL is a heterogeneous group of malignancies that most commonly involve only the skin, the most common of which is mycosis fungoides (MF). MF is a rare disease, and laryngeal manifestations are even more rare, with only 10 documented cases. We present the case of a 67 year old male with known MF who presented with persistently worsening hoarseness, odynophagia, and dysphagia. Flexible laryngoscopy was performed and demonstrated contiguous white, patchy plaques on the mucosa of the oropharynx and pharyngeal walls, and diffusely throughout the supraglottis. A punch biopsy of a palatal lesion was consistent with CTCL. The patient underwent gastrostomy tube placement due to severe dysphagia, and was discharged with planned systemic therapy and otolaryngology followup, but passed away shortly after. Conclusions: Rarely, CTCL can proliferate within the mucosal surfaces of the larynx resulting in dysphagia, odynophagia, hoarseness, cough, or globus sensation. Physicians evaluating patients with these complaints should be aware of the potential for CTCL mucosal involvement. This may allow for expedited diagnoses and fewer misdiagnoses. Additionally, familiarity with the potential for oropharyngeal or laryngeal involvement will allow physicians treating CTCL to comprehensively evaluate and treat the full extent of disease.

96. The Use of Time Driven Activity Based Costing to Assess Cost Efficiency of Tonsillectomy and Adenoidectomy

Phillip A. Nulty, MD, Detroit, MI; Lamont R. Jones, MD MBA, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the concept of time driven activity based cost modeling and its application to medical processes. They will observe of the application of this cost model to select surgical procedures. Participants will also gain knowledge of the results of cost comparisons between surgeries in various care settings via the use of this cost model.

Objectives: To illustrate the use of time driven activity based costing (TDABC) to analyze tonsillectomy and adenoidectomy (T&A) cost, develop a modular platform to analyze cost of various surgical services, compare costs of T&A in various settings, and identify areas for cost reduction. Study Design: Single institution retrospective review and cost analysis. Methods: A process map was created to define activities and personnel involved in T&A. Capacity cost rates for all personnel were calculated. Eight surgeries were reviewed to determine time spent on each activity. Personnel costs were determined using capacity cost rates and activity times then added to equipment costs to determine the total cost. Total cost was compared for two different locations and compared to the total cost calculation from the currently used costing system. Results: The average TDABC cost of T&A at all locations was $1,621. Cost estimated from the current costing system was $4,380. TDABC cost of T&A was $1,955 in the hospital setting and $1,266 in the ambulatory surgical center (ASC). Conclusions: TDABC is effective in calculating costs of surgical encounters and is thought to be more accurate than previously used systems. T&A appears to be less costly than previously estimated with higher contribution margin. This has significant implications for application of bundled payments for T&A. The cost differential between hospital and ASC settings allows for identification of areas for cost reduction. Additional T&A encounters will be analyzed from preoperative to postoperative visits to elucidate cost drivers and areas for process improvement.

97. Gender Differences in Faculty Positions among Top Ranked U.S. Otolaryngology Departments

Nicola Marie Pereira, BA, New York, NY; Ashutosh Kacker, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to identify disparities in gender representation within US academic otolaryngology departments and draw comparisons between representation in otolaryngology and other surgical fields.

Objectives: This study aims to characterize the top ranked departments in otolaryngology to provide an indicator of the state of diversity within otolaryngology and to draw a comparison with other medical and surgical fields. Study Design: This study compared the twenty highest ranked otolaryngology programs according to those listed on the U.S. News & World Report ranking of Best Hospitals for Ear, Nose & Throat. Methods: Faculty demographic and biographical data were collected from departmental websites. The Web of Science h-index was used as a surrogate for academic productivity. Descriptive statistics and chi square analysis were used to characterize the cohort and compare otolaryngology to other fields. Results: Of 562 otolaryngologists on faculty at the 20 highest ranked programs, 413 (73.5%) were men and 149 (26.5%) were women. 174 (31.0%) of the cohort were professors, 145 (25.8%) were associate professors, and 183 (32.6%) were assistant professors. Across faculty appointments, both research and clinical, the proportion of women grew smaller as academic rank increased. Compared to all faculty across U.S. medical schools, the departments in this study had significantly lower proportions of female professors ($p = 0.0047$), associate professors ($p = 0.0009$), and assistant professors ($p = 0.0005$). Male faculty members had higher h indices than their female counterparts among professors ($p=0.004$), associate professors ($p=0.008$), assistant professors ($p=0.0002$), and clinical assistant professors ($p=0.0009$). Conclusions: Women are underrepresented across all academic ranks in top ranked otolaryngology programs. The current state of diversity in otolaryngology yields many opportunities to advance representation for women in the field.

98. Effectiveness of Palate Surgery in the Treatment of Obstructive Sleep Apnea Patients with Lateral Oropharyngeal Wall Collapse

Nidhi Reddy Sama, BS, Tampa, FL; Abhay Sharma, MD, Milwaukee, WI; Emily Coughlin, MPH, Tampa, FL; Rahul Mhaskar, PhD, Tampa, FL; Tapan Padhya, MD, Tampa, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the effect of palate surgery in the treatment of obstructive sleep apnea patients with lateral oropharyngeal wall collapse.

Objectives: Obstructive sleep apnea (OSA) patients with lateral oropharyngeal wall collapse have more severe sleep apnea symptoms and less success with surgical interventions. The purpose of this systematic review and meta-analysis is to assess the effectiveness of palate surgery as a treatment method for OSA in patients with this type of collapse. Study Design: A systematic review and meta-analysis was conducted using PubMed, Embase, and Scopus databases. Patients had undergone drug induced sleep endoscopy, Muller maneuver, or nasal endoscopy showing lateral oropharyngeal wall collapse and a subsequent intervention that included palatal surgery. Methods: Single arm meta-analysis was conducted using Stata SE Version 24 and R. Studies were pooled using random effects models. Results: 21 studies were included with a total of 627 patients in the analysis. The pooled postoperative mean apnea hypoxia Index (AHI) of patients with lateral wall collapse that underwent palate surgery was 15.64 (95% CI 11.63 -19.65]. The pooled percent success of the surgeries was 70% (95% CI 0.63-0.76) with the most common definition of success being Sher criteria. The mean postoperative ESS (Epworth Sleepiness Scale) was 6.69 (95% CI 5.52-7.86] and lowest mean O2 saturation was 86.47 (95% CI 83.43-89.51). Conclusions: The success rate was 70%, indicating that palate surgery can be an effective form of treatment in patients with lateral wall collapse.

99. Geographic Distribution of Otolaryngology Training Programs and Potential Opportunities for Strategic Growth

Drew H. Smith, MD MS, Lubbock, TX; Hannah Case, BS, Jacksonville, FL; Humzah A. Quereshy, MD, Cleveland, OH; Jeffrey C. Mecham, MD, Phoenix, AZ; Matthew L. Carlson, MD, Rochester, MN; Joehassin Cordero, MD, Lubbock, TX

Educational Objective: To characterize the geographic distribution of otolaryngology residents based on US population density in order to detect potential opportunities for otolaryngology residency program expansion.

Objectives: Otolaryngology residency programs are dispersed across the US, with clustering in large metropolitan cities. We aim to describe the overlay of residency training programs on current US population density maps to identify strategic areas for potential training program expansion based on metropolitan census data. Study Design: Cross-sectional. Methods: The locoregional population with otolaryngology residency programs was analyzed (as defined by the United States census) and the number of resident trainees per 100,000 people in each region was calculated. Otolaryngology residency program location was determined by mailing address and program size was determined by AAMC public data. Results: The average metropolitan city in the US contained 4.00 otolaryngology trainees per 100,000 people. Cities with identifiable growth potential included Phoenix, AZ (0.20 trainees per 100,000 people); Las Vegas, NV (0.26 per 100,000); Dallas, TX (0.26 per 100,000), Miami, FL (0.32 per 100,000); Atlanta, GA (0.33 per 100,000); Washington, DC (0.35 per 100,000), Riverside, CA (0.37 per 100,000); and San Antonio, TX (0.39 per 100,000). Comparing otolaryngology to other surgical subspecialties demonstrated similar distributions. Metropolitan centers with a population over 1 million without full academic representation in otolaryngology were also identified and include Charlotte, NC; Orlando, FL; Austin,

TX; Providence, RI; Jacksonville, FL; Raleigh, NC; and Grand Rapids, MI. Conclusions: Strategic residency training program expansion should be considered in cities that exhibit a low trainee to population ratio. While many factors ultimately determine program expansion or development of new training programs, this study provides substantiated population data describing where expansion could be prioritized.

100. Perceptions of Otolaryngology Residency among Students Underrepresented in Medicine

Adam Thompson-Harvey, MD, Milwaukee, WI; Marc Drake, MD, Milwaukee, WI; Valerie Flanary, MD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand perceptions of OHNS from students who are underrepresented in medicine (URiM) and identify factors affecting URiM application to the specialty.

Objectives: Otolaryngology-head and neck surgery (OHNS) has historically been one of the least diverse surgical subspecialties. The objective of this study was to better understand perceptions of OHNS from students who are underrepresented in medicine (URiM) and identify factors affecting URiM application to the specialty. Study Design: National survey via electronic questionnaire. Methods: An anonymous, 22 question electronic survey was administered to URiM medical students (N=388) regarding factors that play a role in developing an interest in applying to OHNS. Responses to questions were compared between URIMs applying to OHNS and those applying to other fields. Results: Thirty-six percent of respondents identified as non-Hispanic Black, and 26% as Hispanic/Latino. The survey was completed by students from each year of medical school. Research opportunities ($H(2)=18.58$, $p<0.001$) and having a role model of the same race and ethnicity were the most important factors for URiM students pursuing OHNS residency. Personality fit and interactions with OHNS faculty had the greatest influence on their decision to pursue the specialty ($H(2)=71.63$ and 61.26, $p<0.001$ for both, epsilon-squared= 0.274 and 0.230, respectively). Board scores (e.g., USMLE step 1/2CK scores), competitiveness, and lifestyle during residency did not reach statistical significance nor did the influence of application costs or racial/ethnic and gender distributions on participants' decision to pursue OHNS residency. URiM students pursuing OHNS residency also reported COVID-19 having a significant influence on away rotations ($z=-2.71$, $p=0.007$, $r=0.622$), board examinations ($z=-3.37$, $p<0.001$, $r=0.773$), and getting to know faculty ($z=-2.81$, $p=0.005$, $r=0.644$). Conclusions: Improving diversity within OHNS residency programs has remained a challenge, and this study provides information to better tailor residency recruitment efforts. We found that establishing meaningful connections with URiM mentors makes significantly impacts URiM students considering OHNS. To increase the number of URiM residency applicants, OHNS residents, faculty, and administrators are key in identifying URiM mentees and establishing meaningful educational interactions.

101. Botox Related Industry Payments to Physicians: How Much, and Do Specialties Compare?

Sina J. Torabi, MD, Irvine, CA; Milind Vasudev, BS, Irvine, CA; Jack L. Birkenbeuel, BS, Irvine, CA; Brian J.F. Wong, MD PhD, Irvine, CA; Edward C. Kuan, MD MBA, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand trends in Botox related industry payments, and understand differences in these trends by medical specialty (otolaryngology, plastic surgery, and dermatology).

Objectives: To evaluate trends in botulinum toxin (BT) industry payments to providers from top utilizing medical specialties. Study Design: Cross-sectional analysis of the 2016-2020 Open Payments database. Methods: Non-royalty, botulinum toxin (BT) specific payments made by Allergan (Botox), Ipsen (Dysport), and Merz (Xeomin) to otolaryngologists (ORL), plastic surgeons (PRS), and dermatologists (DERM) were collected and characterized. Results: Between 2016-2020, over $10 million dollars in non-royalty payments was made by for BT related activity to ORL, PRS, and DERM specialists, with payments increasing from $333 thousand in 2016 to $4.4 million and $2.9 million in 2019 and 2020, respectively. Of this total, 59.4% of it was paid to DERM, 24.9% to PRS, and 15.7% to ORL physicians. However, given that there were fewer total ORLs who were given BT related payments (2020: 311 ORL, 912 PRS, 1443 DERM), ORLs who were given BT related payments tended to be paid more (2020: $1616 per ORL, $710 per PRS, $1189 per DERM). Consulting fees made up the largest proportion of these payments (41.4%), with speaking fees (21.7%) and food/beverage fees (15.9%) trailing behind. Conclusions: A significant, and growing, amount of money is being paid to physicians for BT related activities, which may have implications in conflicts of interest. Despite the variety of indications for which BT is utilized within otolaryngology, ORL payments were overshadowed by payments to PRS and DERM, which may indicate that other fields utilize BT more often. Nevertheless, when calculated per physician, ORLs were paid the most, which might indicate that this finding may simply be secondary to the workforce available to inject BT.

102. Risk Factors Associated with Unplanned Admissions following Outpatient Thyroglossal Duct Cyst Removal

Sugosh M. Anur, BS, Stratford, NJ; Edward Lai, BSE, Stratford, NJ; Ariel Omiunu, BS, Newark, NJ; Sudeepti Vedula, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the risk factors associated with unanticipated hospital admission in adult patients after outpatient thyroglossal duct cyst removal.

Objectives: The objective of this study is to examine the risk factors associated with unplanned admissions for patients undergoing

outpatient thyroglossal duct cyst (TGDC) removal. Study Design: Retrospective cohort study. Methods: The 2005-2018 American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database was queried to select for cases of TGDC removal, using current procedural terminology (CPT) codes. Only outpatient, nonemergent procedures were included in the study. Unplanned admission was defined as length of hospital stay greater than 0 days. Univariate analysis was performed using Pearson chi square and unpaired t-tests. Multivariate analysis determined which variables independently predicted unplanned admission. Results: 1508 patients underwent outpatient TGDC removal, 497 (33%) of whom experienced unplanned admission. Admitted patients were more likely to be older (47.2 vs 43.7, P<0.001), ASA classification III-IV (21.3% vs 14.3%, P=0.001), have COPD (2% vs 0.8%, P = 0.04), and hypertension requiring medication (30% vs 19.9%, P<0.001). Intraoperative characteristics such as operative time (98.4 min vs 73.2 min, P 72 minutes was found to be an independent risk factor for unplanned admission (OR: 2.572, P<0.001). Conclusions: Our study found that patients with comorbidities such as COPD and hypertension requiring medication are more likely to experience unplanned admission following TGDC.

103. Botulinum Toxin A Treatment in Pregnant Spasmodic Dysphonia Patients: Case Series

Kaishan Aravinthan, MD BKin, Vancouver, BC Canada; Amanda Hu, MD FRCSC, Vancouver, BC Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role for onabotulinumtoxinA (BTX) for the treatment of spasmodic dysphonia (SD) in pregnant women.

Objectives: At the conclusion of this presentation, the participants should be able to understand the role for onabotulinumtoxinA (BTX) for the treatment of spasmodic dysphonia (SD) in pregnant women. Study Design: The use of onabotulinumtoxinA (BTX) for the treatment of spasmodic dysphonia (SD) is an off label indication, but it has become a widely accepted first line treatment. Currently, the U.S. Food and Drug Administration designates (BTX) as a pregnancy category C drug because there are no adequate or well controlled studies in pregnant women. As SD can occur in women of reproductive years, it is of concern to ensure that the mainstay treatment of SD is considered safe during pregnancy. Methods: A retrospective chart review was conducted of pregnant women who received BTX for treatment of SD at an academic tertiary care center. Otolaryngology and obstetrical clinical data were collected. Results: Four adductor SD patients received BTX during each of their two pregnancies; thus, a total of eight pregnancies were examined. Six of eight pregnancies received BTX treatment in all three trimesters. Patients received a median of 5 treatments (IQR 7) of BTX during their pregnancies with a median total dose of 0.75U (IQR 0.55U). Median maternal age at the time of birth was 33.5 (IQR 3.5). Of eight deliveries, one was preterm and seven were term. Six were caesarean sections and two were vaginal. Median APGAR score was 9 (IQR 0.5). No significant morbidity or mortality was noted to mother or child. All children are alive and well, with a median age of 7 (IQR 2). Conclusions: This case series is the largest in the literature of pregnant SD patients undergoing BTX treatment. This report adds to the growing literature on the safety of BTX during pregnancy.

104. Spontaneous Intralabyrinthine Hemorrhage in a Healthy Pediatric Patient

Marwan Boulis, MD, Detroit, MI; Marc Thorne, MD MPH, Ann Arbor, MI; Ilaaf Darrat, MD MBA, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to appropriately consider spontaneous intralabyrinthine hemorrhage as a differential diagnosis for sudden sensorineural hearing loss in an otherwise healthy pediatric patient.

Objectives: To present a case of spontaneous intralabyrinthine hemorrhage and discuss the literature review. Study Design: Case report and literature review. Methods: A retrospective chart review was performed on a patient with left sided sudden sensorineural hearing loss in the setting of a spontaneous intralabyrinthine hemorrhage. A PubMed literature review was also conducted. Results: A 9 year old healthy female who presented to her pediatrician with a one day history of left sided otalgia, tinnitus, aural fullness and one week history of persistent dizziness. Otoscopy was charted as consistent with a left sided middle ear effusion. She was prescribed Flonase and a 10 day course of amoxicillin. Laboratory results were within normal limits. As there was no improvement in her symptoms after a month, she was referred to the pediatric otolaryngologist. Physical exam revealed an intact tympanic membrane on the left and a well aerated middle ear space. An audiogram revealed a severe sensorineural hearing loss. Discussion with the patient and family regarding the use of high dose steroids (oral or injection) concluded with deferment due to age and the unlikelihood of benefit as it had been almost two months from presentation. MRI acoustic with and without contrast revealed an intrinsic T1, T2 and T2 FLAIR hyperintensity within the base of the left cochlea that was nonenhancing, suspicious for intralabyrinthine hemorrhage. CT temporal bone on 1/20/2020 revealed normal temporal bone anatomy. She underwent successful cochlear implantation with a Cochlear 632 device. Conclusions: Intralabyrinthine hemorrhage should be on the differential for sudden sensorineural hearing loss in an otherwise healthy pediatric patient.

105. The Required Otolaryngology Rotation at a University School of Medicine

Eve M.R. Bowers, MD, Miami, FL; Aaliyah C. Riccardi, MD, Pittsburgh, PA; David E. Eibling, MD, Pittsburgh, PA; Melonie Nance, MD, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation the audience will be able to fully understand the vitality of graduating medical trainees becoming proficient in providing quality care in the face of basic otolaryngology complaints. The audience will also

be able to understand the utility of a required otolaryngology clerkship in this realm.

Objectives: Equipping medical students to handle basic otolaryngologic complaints is a critical yet challenging obligation of the medical education community. Otolaryngologic problems in adult and pediatric primary care settings represent > 20% of presenting complaints. Graduating medical trainees should be comfortable providing quality otolaryngologic primary care to their patients, but medical school graduates report low confidence levels in handling otolaryngologic complaints. Our university's school of medicine facilitates medical students to rotate through a one week otolaryngology experience during the required specialty care clerkship (SCC). Study Design: 67 third and fourth year medical students at our university school of medicine completed the required otolaryngology clerkship. Students learned about otolaryngologic equipment, terminology, diagnosis, and management by spending a week in clinic and operating rooms with otolaryngology residents and attendings. Students took a final examination, received clinical grades from preceptors, and recorded patient encounters. Methods: At the completion of the 1 week otolaryngology rotation students were sent a survey. This survey collected data on the diversity of procedures and participant feedback. The resulting data, the exam scores and clinical grades were then analyzed. Results: The average clinical and exam scores for the otolaryngology portion of the SCC exam, over six months, was 4.5/5 and 75% respectively. 85% of students rated the quality of the lectures "outstanding" or "very good", and 72% of students strongly agreed or agreed with the statement "overall teaching in clinical setting was good quality". Conclusions: Our results suggest that this required otolaryngology clerkship is effective and engaging for most students, independent of their career plans. Moving forward, this course can be improved with a clinical skills checklist, a standardized syllabus, and case based lectures. These modifications will be incorporated in our planned curriculum reform. This required rotation is an opportunity to expose those not traditionally represented in the population of working otolaryngology surgeons and has the potential to be a conduit of increased diversity with time. This course may be tailored to meet limitations of existing curriculums and resources at outside medical institutions.

106. WITHDRAWN - Correlation between Voice Quality and Swallow Function in Patients with Parkinson's Disease
Hannah Daniel, MBA, Lubbock, TX; Amanda Gillespie, PhD, Atlanta, GA; Anthony Law, MD, Atlanta, GA

107. WITHDRAWN - Demographic Disparities in Adenoidectomy Procedures
Hannah Daniel, MBA, Lubbock, TX; Rahul Varman, MD, Lubbock, TX

108. Cochlear Implants in Social Media: An Opportunity for Patient Engagement
Calista L. Dominy, BS, New York, NY; Evan S. Kominsky, BA, New York, NY; Eleni A. Varelas, BA, New York, NY; Alfred Iloreta, MD, New York, NY; Joshua Rosenberg, MD, New York, NY; Aldo Londino, MD, New York, NY

Educational Objective: To inform physicians and other healthcare providers about the state of cochlear implant related social media content as well as about how they can utilize social media to expand their network, share new research, and improve current patient education strategies.

Objectives: To analyze the portrayal of cochlear implants on a social media platform in order to inform how healthcare providers can engage with social media users to improve education, address patient concerns, and share research. Study Design: Cross-sectional descriptive study. Methods: Publicly available Twitter data were acquired from May to August 2021 using application programming interface (API). Inclusion criteria consisted of tweets containing the hashtag "#cochlearimplant" that were directly about cochlear implant devices or users. Tweets were excluded if they were considered not related to cochlear implants as rated by two independent reviewers. Type of media, perspective, content, and tone of all tweets was recorded. Results: Of 373 tweets, the majority included a link to an external website (53.9%) or media (picture: 26.5%, video 12.1%). Tweets were published by a professional organization (46.4%), a hospital or clinic (21.2%), a cochlear implant recipient (10.2%), a physician or other medical professional (9.9%), a device manufacturer (6.4%), a family member or friend of a patient (1.3%), and 4.6% other. The vast majority were neutral (77.7%), some with positive tone 20.9%, and few negative tweets (1.3%). Overall, 31.1% of tweets were about education and awareness, 29.5% were about patient stories, 18.8% were about cochlear implant research, 9.1% were device marketing related, 1.3% were clinical questions, 0.8% were about fundraising, and 9.4% miscellaneous. Conclusions: The majority of cochlear implant related content on Twitter originates from a professional organization or hospital with overall neutral tone. The small percentage of provider tweets provides an opportunity to raise awareness of cochlear implantation in a positive light.

109. Learningoscope Course: Utilization the Five Step Method to Teach Flexible Fiberoptic Laryngoscopy
Brandon Esianor, MD, Nashville, TN; Ankita Patro, MD, Nashville, TN; Daniel Schuster, MD, Nashville, TN; John Seibert, MD, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand and apply the five step method to teaching psychomotor skills.

Objectives: Flexible fiberoptic laryngoscopy (FFL) is a fundamental procedure performed by otolaryngologists to examine the upper aerodigestive tract. Developing the psychomotor skills necessary for FFL is essential for learners planning to pursue a career in otolaryngology-head and neck surgery. Here we present a concise and straightforward five step teaching method to improve pro-

cedural knowledge and technical skills required for FFL. Study Design: Interventional pre-post study design. Methods: Medical students applying to otolaryngology were invited to participate in a single session FFL course. Supplemental reading and video resources were provided before the session. Two residents and two attending physicians served as instructors for the course and executed the five step psychomotor skills approach to teach learners. Pre-session and post-session surveys were administered to gather qualitative information on participants' experiences and the effectiveness of the five step process. Results: Five medical students applying to OHNS participated in the course. All participants had observed flexible laryngoscopy be performed. Confidence with performing the procedure was reported as low (60%), neutral (20%), and high (20%). The pre-session procedural knowledge assessment score average was 40.8/100, post-session average improved to 87.6%. All participants agreed that the five step model was clear and concise. All participants felt comfortable performing FFL independently after the session. Conclusions: The five step method is a concise and straightforward method for teaching psychomotor skills. The Learningoscope course utilized this approach and improved medical students' procedural knowledge and comfort with performing flexible laryngoscopy.

110. Otologic Manifestations of Rapid Weight Loss: A Systematic Review and Meta-Analysis

Tamar M. Gordis, BA, Charleston, SC; Tiffany Chen, BA, Charleston, SC; Mallory J. Raymond, MD, Charleston, SC; Ted A. Meyer, MD PhD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the variety and rate of otologic symptoms that patients experience after rapid weight loss.

Objectives: Otologic symptoms have been reported in patients who lost weight after undergoing bariatric surgery or developing eating disorders. We aimed to examine the array of otologic symptoms following rapid weight loss. Study Design: Systematic review and meta-analysis. Methods: Following PRISMA guidelines, PubMed, Scopus, CINAHL, and Cochrane Library databases were searched from inception to October 7, 2021, for studies reporting otologic complaints from patients with rapid weight loss either following weight loss surgery or from eating disorders. Patient demographics, weight loss metrics, and otologic symptoms were collected. Meta-analyses of proportions and pooled means were calculated. Results: Thirteen articles were included with 298 patients (69.4% female). The mean age was 39.9±10.6 years. Otologic symptoms included autophony (hearing one's own breathing, n=110, 51.9%; hearing one's own voice n=133, 62.7%), aural fullness (n=90, 30.2%), tinnitus (n=18, 8.5%), and otalgia (n=51, 24.1%). Mean symptom onset ranged between 2-6 months following weight loss. In 212 patients with otologic complaints following rapid weight loss, 29.6% were diagnosed with pETD. Patients who underwent weight loss surgery had a mean weight loss of 43.4kg, mean percent reduction in weight of 32.6%, and mean BMI at onset of otologic symptoms of 37.2kg/m2. Patients with a history of eating disorders had a mean weight loss of 20.5kg, mean percent reduction in weight of 31.0%, and a mean BMI at onset of symptoms of 14.6kg/m2. Conclusions: Otologic symptoms following rapid weight loss are suggestive of high rates of development of pETD. Providers should screen for symptoms of pETD and counsel patients on its management in the setting of rapid weight loss.

111. Sialoendoscopy with Balloon Dilation in Idiopathic Parotid Duct Stenosis

Alex J. Gordon, BS, New York, NY; Aneek Patel, BS, New York, NY; Babak Givi, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the potential benefits and risks of using balloon dilation to treat parotid duct stenosis.

Objectives: Little evidence exists on the efficacy of balloon dilation in patients undergoing sialoendoscopy for parotid duct stenosis. We present a series of patients who underwent this procedure with emphasis on symptomatic relief and complications. Study Design: Historical chart review. Methods: We identified all patients who underwent sialoendoscopy with balloon dilation for idiopathic parotid duct stenosis at our institution from 12/1/2015 to 9/1/2021. Patient demographics, comorbidities, presenting symptoms, and operative techniques were collected. Primary outcome was symptom resolution at last followup. Symptom recurrence and necessity of additional procedures were recorded. Results: We identified 25 patients who underwent sialoendoscopy of 34 parotid ducts. Sixteen (64%) patients were female, and median age was 54.9 (24.2-74.1) years. Twenty-three (92%) patients presented with facial swelling, and 16 (64%) presented with facial pain. Median preoperative symptom duration was 6 (1-48) months. Seventeen (68%) procedures were performed under IV sedation, and 8 (32%) were performed under general anesthesia. Eight (32%) patients received stents, 6 (75%) of which were placed under IV sedation. No patients experienced immediate complications. Among patients with followup (20, 80%), symptomatic improvement was reported by 16 (89%) patients with swelling, 13 (93%) with pain, and 18 (95%) with either symptom. Seven (39%) patients experienced symptomatic recurrence after initial improvement. Median time to recurrence was 6 (2-8) months. Four (22%) patients required additional sialoendoscopy, of which 3 (75%) reported symptom relief. Conclusions: Sialoendoscopy with balloon dilation is effective at relieving symptoms in patients with idiopathic parotid duct stenosis. This procedure is safe and can be performed without general anesthesia.

112. Immune Cell Infiltration of the Hypopharynx following Immune Checkpoint Therapy for Breast Cancer

Karen Kam Hoi, BS, Ann Arbor, MI; Tianhong Li, MD PhD, Sacramento, CA; Arnaud Fassett Bewley, MD, Sacramento, CA; Maggie Ann Kuhn, MD, Sacramento, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify etiologies of a pharyngeal

mass in a non-head and neck cancer patient receiving immune checkpoint therapy. Participants should be able to recognize that immune related adverse events can occur throughout the body and can mimic malignancy. Furthermore, participants should be able to describe the advantages and limitations to in-office biopsy in ruling out aerodigestive malignancy.

Objectives: To describe a novel case of activated lymphocyte infiltration of the hypopharynx associated with cervical lymphadenopathy in a patient treated with anti-PDL1 therapy for triple negative breast cancer (TNBC). Study Design: Case report. Methods: The patient's presentation, clinical course, management, and followup findings are reported. A review of literature on immune related adverse events (irAE) in the pharynx is summarized. Considerations for diagnosis and management of similar presentations are presented. Results: A 48 year old female with TNBC who previously underwent neoadjuvant chemotherapy, lumpectomy, adjuvant radiation, gamma knife, two surgical brain resections, and 6 cycles of pembrolizumab for metastatic disease was started on second line systemic therapy with atezolizumab and Abraxane. After 12 cycles, she reported dysphonia, odynophagia, weight loss, chills, sweats and hemoptysis. PET-CT demonstrated new uptake around the right pyriform sinus extending across midline with hypermetabolic right level 1-3 cervical lymph nodes. Flexible laryngoscopy revealed fullness and obliteration of the right pyriform sinus concerning for malignancy. In-office biopsy through a channeled laryngoscope demonstrated inflammatory and reactive changes. FNA biopsy of a right level 2 lymph node showed a lymphocytic population without malignant cells. Atezolizumab was discontinued. Symptoms improved after 6 weeks. PET-CT 3 and 6 months later showed resolution of hypopharyngeal and lymph node activity. Conclusions: Lymphocytic infiltration of the head and neck is an unreported irAE. Biopsy is useful in differentiating malignancy from irAE. A high suspicion and awareness that irAE may occur anywhere in the body is necessary in order to guide timely diagnosis and management.

113. Examining Sleep Architecture Changes in OSA Patients Treated with HNS Therapy

Kene-Chukwu C. Ifeagwu, BS, San Francisco, CA; Yi Cai, MD, San Francisco, CA; Yixuan James Zheng, BA, San Francisco, CA; Chloe Cheng, BA, San Francisco, CA; Jolie Chang, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to assess the potential use of wearable sleep technology during HNS therapy up-titration.

Objectives: To examine sleep architecture changes using a wearable sleep tracking device (the Oura Ring) in obstructive sleep apnea (OSA) patients after hypoglossal nerve stimulator (HNS) implantation. Study Design: Case series. Methods: We enrolled HNS patients at the time of HNS therapy activation. Oura Ring metrics during the first week of each month after activation of HNS therapy (baseline) was compared across the first 4 months. Patients were given a validated questionnaire of symptom measures at baseline and 4 months. Results: Five subjects showed no significant changes compared to baseline in total sleep time (6.1 +/- 1.5 vs. 5.4 +/- 1.2 hours), sleep onset latency (13 +/- 9 vs. 8 +/- 2 minutes), wake time after sleep onset (85 +/- 45 vs. 94 +/- 42 minutes), REM sleep percentage (18% +/- 5% vs. 17% +/- 6%), and non-REM sleep percentage (82% +/- 5% vs. 83% +/- 6%). Readiness score, an Oura Ring metric for recovery incorporating recent sleep patterns, activity, and vitals, did not change significantly (p=0.673). However, the Epworth Sleepiness Scale score (11.8 +/- 5.2 vs. 8.3 +/- 4.7) and the Insomnia Severity Index score (14.8 +/- 4.0 vs. 11.5 +/- 3.4) decreased, correlating to patient's self-reporting that their sleep quality and sleep symptoms were improved compared to baseline. Conclusions: There were no significant changes in sleep architecture in a small cohort of HNS patients during the first 4 months of their device titration, as measured by a wearable sleep tracking device.

114. Functional Hearing and Tinnitus Outcomes in Treated Large Vestibular Schwannoma and Posterior Fossa Meningioma

Nicole T. Jiam, MD, San Francisco, CA; Danielle M. Gillard, MD, San Francisco, CA; Ramin A. Morshed, MD, San Francisco, CA; Jennifer Henderson Sabes, AuD, San Francisco, CA; Philip V. Theodosopoulos, MD, San Francisco, CA; Steven W. Cheung, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe distinctions and similarities of functional hearing and tinnitus outcomes in treated large vestibular schwannoma and posterior fossa meningioma.

Objectives: To contrast functional hearing and tinnitus outcomes in treated large vestibular schwannoma (VS) and posterior fossa meningioma cohorts. Study Design: Cross-sectional. Methods: A two way MANOVA model with two independent variables (tumor type; time from treatment) and three dependent variables (hearing effort of the tumor ear; abbreviated Speech, Spatial and Qualities of Hearing scale (SSQ12); Tinnitus Functional index (TFI)) was used to analyze outcomes data from VS (N=32) and meningioma (N=50) patients who were treated at a tertiary care center between 2000-2020 and completed all study survey instruments. Preoperative linear mean tumor size (~3 cm) was matched for the two cohorts. Results: Tumor type was statistically significant on the combined dependent variables analysis, $F(3, 76) = 19.172$, $p < .0005$, Wilks' $\Lambda = .569$. Meningioma showed better outcome for functional hearing in the features of hearing effort ($F(1, 76) = 14.632$, $p < .0005$) and SSQ12 ($F(1, 76) = 16.164$, $p < .0005$), but not for TFI ($F(1, 76) = 1.247$, $p = .268$) on followup univariate two way ANOVA analyses. Meningioma hearing effort outcome was better within 2 years ($p = .005$), whereas SSQ was better beyond 2 years ($p = .017$) of treatment. Conclusions: Functional hearing outcome is better for large posterior fossa meningioma compared to VS. The short term hearing effort and long term SSQ12 assessments are superior. Tinnitus outcome is indistinguishable between the two tumor types. Those distinctions and similarities may be useful

to both providers and patients for calibration of treatment outcome expectations.

115. Impact of Hospital Safety Net Burden on Oropharyngeal Cancer Survival

Ryan Jin, BS, Newark, NJ; Megh Shah, BS, East Brunswick, NJ; Christopher C. Tseng, BS, Newark, NJ; Rushi Patel, BA, Newark, NJ; Dylan F. Roden, MD, Newark, NJ; Richard Chan Woo Park, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to evaluate the relationship between hospital safety net burden and survival for patients with oropharyngeal cancer.

Objectives: To determine the impact of hospital safety net burden on survival for oropharyngeal cancer patients. Study Design: Retrospective database review. Methods: The National Cancer Database (NCDB) was used to identify patients with primary, invasive cancers of the oropharynx between 2004-2016. Hospital safety net burden was defined by percentile of uninsured/Medicaid oropharyngeal cancer patients treated per year: <25th percentile for low safety net burden hospitals (LBH), between 25-75th percentile for medium (MBH), and ≥75th percentile for high (HBH). Univariate and multivariate analyses were performed. Results: We queried 68,543 cases. Patients of Black race (OR 1.57, 95% CI 1.48-1.66, p<0.001), Charlson-Deyo score ≥3 (OR 1.16, 95% CI 1.01-1.34, p=0.038), clinical T stage 4 (OR 1.35, 95% CI 1.26-1.45, p<0.001), and clinical N stage 3 (OR 1.21, 95% CI 1.08-1.35, p<0.001) had increased likelihood of being treated at HBH. Highest income quartile (OR 0.40, 95% CI 0.37-0.43, p<0.001) or highest education quartile (OR 0.80, 95% CI 0.74-0.86, p<0.001) reduced odds. LBH patients had improved 10 year survival (51.6%) compared to MBH (44.4%) and HBH (38.9%) (p<0.001). Cox regression analysis revealed treatment at MBH (HR 1.08, 95% CI 1.04-1.12, p<0.001) or HBH (HR 1.10, 95% CI 1.05-1.14, p<0.001) was associated with increased mortality when compared to LBH. Conclusions: Oropharyngeal cancer patients who were Black, of lower socioeconomic status, and presenting with advanced disease were more likely treated at HBH. Further study is warranted to detect disease at an earlier stage, specifically in underserved areas surrounding HBH.

116. Noise Induced Hearing Loss in the Contralateral Ear during Otologic Surgery

Vivian F. Kaul, MD, Columbus, OH; Meghan M. Hiss, AuD, Columbus, OH; William J. Riggs, AuD PhD, Columbus, OH; Mehak Chawla, BS, Columbus, OH; Vikas Munjal, BS, Columbus, OH; Oliver F. Adunka, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the noise induced effects of contralateral surgical drilling. Participants should be able to grasp the audiometric impact of different types of surgical drilling procedures on the non-operated side.

Objectives: To determine if noise from surgical drilling affects audiometric outcomes of the contralateral ear. Study Design: Retrospective review. Methods: Between May 2016-2021, 372 English speaking patients were identified who underwent one of the following otologic or neurotologic surgeries: middle cranial fossa (MCF), translabyrinthine, transmastoid, retrosigmoid, labyrinthectomy, or endolymphatic sac (ELS) surgery. Patients were excluded if they were older than 75 or had multiple ear surgeries between the pre and postoperative audiograms. Outcome measures included age, operative time, pure tone averages (PTA), audiometric thresholds, and word recognition scores (WRS). Results: Of the 372 patients, 204 met inclusion and exclusion criteria who also had pre and postoperative audiograms completed. There were 41 MCF, 48 translabyrinthine, 47 transmastoid, 20 retrosigmoid, 14 labyrinthectomies, and 34 ELS surgeries. We looked at the change in audiometric thresholds from 250-8000 Hz and the change in WRS. Average change in WRS's in MCF: 0% (SD 4%), translabyrinthine: 0.4 (SD 5), transmastoid: -1.9 (SD 6.7), retrosigmoid: 1.9 (SD 5.2), labyrinthectomy: 0.3 (SD 22), and ELS: -3.6 (SD 16.7). Average change in PTA's in MCF: 2.8 dB (SD 4.8), translabyrinthine: 1.0 (SD 5.4), transmastoid: 2.6 (SD 6.2), retrosigmoid: 1.0 (SD 6.3), labyrinthectomy: 6.1 (SD 12.8), and ELS: 1.4 (SD 5.1). Conclusions: While otologists and neurotologists may fear that the noise induced by surgical drilling for a prolonged duration can affect the contralateral hearing, our case series does not show any change in audiometric thresholds after surgery.

117. Utility of Preoperative Laboratory Testing among Low Risk Patients in Ambulatory Thyroglossal Duct Cyst Removal

Edward Lai, BSE, Stratford, NJ; Sugosh M. Anur, BS, Stratford, NJ; Ariel Omiunu, BS, Newark, NJ; Sudeepti Vedula, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the implications of preoperative laboratory testing on postoperative outcomes and management.

Objectives: The objective of this study is to examine the pattern of preoperative laboratory testing (PLT) in patients undergoing ambulatory thyroglossal duct cyst (TGDC) removal and to assess their effects on postoperative complications. Study Design: Retrospective cohort study. Methods: The 2005-2018 American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database was queried for low risk patients (e.g., ASA class 1 or 2) undergoing TGDC removal. Patients with congestive heart failure and sepsis were excluded from the study. PLTs were separated into chemistry, hematology, coagulation, and liver function tests. Univariate analysis and binary logistic regression were performed to determine the independent effects of covariates on post-surgical complications. Results: 1184 low risk patients underwent ambulatory thyroglossal duct cyst removal procedure, 720

of which had at least one PLT performed. Major complications were seen in 2.6% of patients. Patients with hypertension requiring medication (p=0.009) were more likely to receive a PLT. Our study found no statistical significance in patients who acquired any major medical or surgical postoperative complications. Additionally, logistic regression analysis demonstrated that chemistry tests (p=0.569), hematology tests (p=0.631), coagulation tests (p=0.129), and liver function tests (p=0.894) were not statistically significant in predicting postoperative complications. Conclusions: This study shows that the use of preoperative lab testing for patients undergoing ambulatory thyroglossal duct cyst removal is not associated with severe postoperative complications. This study supports current ASA guidelines that recommend against this practice due to lack of direct clinical benefit.

118. Neonatal Abstinence Syndrome as a Risk Factor for Hearing Loss

Seong Min Lee, BA, Richmond, VA; Tiffany Kimbrough, MD, Richmond, VA; Emily Jenkins, MED, Richmond, VA; Kelley Melissa Dodson, MD, Richmond, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the association between neonatal abstinence syndrome and newborn hearing loss.

Objectives: Neonatal abstinence syndrome (NAS) is an epidemic secondary to the opioid crisis causing significant socioeconomic burden to patients, families, and the healthcare system. Prior studies have shown NAS patients to have higher risk of poor health outcomes and speech/language delay, but there is limited data on hearing loss. This study aimed to assess the association of hearing loss in the NAS population. Study Design: Retrospective chart review. Methods: A retrospective chart review of all infants with NAS between November 2017, and May 2021, at a university hospital was conducted to evaluate prevalence of hearing loss, presence of JCIH risk factors, and later speech and language milestones when available. Results: Among 218 infants born with NAS, 8 infants (3.7%) failed initial UNHS. Of these, 2 infants (25%) were diagnosed with sensorineural hearing loss, 2 (25%) had normal diagnostic auditory brainstem responses (ABR), and 4 (50%) were lost to followup. Additionally, 5 infants with NAS who passed initial UNHS later had speech delays and concern for hearing loss. Of those, 1 was diagnosed with sensorineural hearing loss, 1 had normal diagnostic ABR, and 3 were lost to followup. All infants with confirmed hearing loss had a JCIH risk factor for hearing loss. Conclusions: NAS infants are a vulnerable population with significant risk of adverse health outcomes including higher rates of being lost to followup. Further studies should examine NAS as an independent risk factor for neonatal hearing loss.

119. Long Term Trends in Tinnitus Severity of Cochlear Implant Recipients with Asymmetric and Unilateral Hearing Loss

Erin M. Lopez, MD, Chapel Hill, NC; Margaret T. Dillon, AuD, Chapel Hill, NC; Meredith A. Rooth, AuD, Chapel Hill, NC; Harold C. Pillsbury, MD, Chapel Hill, NC; Kevin D. Brown, MD PhD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) explain how tinnitus relates to AHL and UHL; 2) demonstrate how cochlear implantation can affect perceived tinnitus; and 3) explain the benefits of cochlear implantation pertaining to long term quality of life.

Objectives: To assess the influence of long term cochlear implant (CI) use on perceived tinnitus severity for adults with asymmetric hearing loss (AHL) and unilateral hearing loss (UHL). Study Design: Prospective, repeated measures. Methods: Forty adult CI recipients with moderate to profound UHL or AHL underwent cochlear implantation as part of a clinical trial assessing the effectiveness of CI use for cases of AHL and UHL. Tinnitus severity was evaluated subjectively with the Tinnitus Handicap Inventory (THI). Subjects completed the THI preoperatively, and at 1 month, 1 year, 2 years and 5 years post-activation. Results: Subjects reported a significant reduction in tinnitus severity with CI use by 1 month post-activation. The majority of subjects reported tinnitus severity to be minimal through the 5 year post-activation visit. Six subjects, three with UHL and three with AHL, reported tinnitus severity with the CI fluctuated. One subject with AHL reported an increase in tinnitus severity at the 5 year visit as compared to their preoperative perceptions. Conclusions: Adult CI recipients with AHL and UHL report an early reduction in tinnitus severity with CI use that is maintained with long term device use. Significant reductions in tinnitus severity may contribute to the overall improvements in quality of life reported by CI recipients with AHL and UHL.

120. Hearing Loss and Risk of Mild Cognitive Impairment and Dementia: Comprehensive Audiometric Testing in a Study of Aging

John P. Marinelli, MD, JBSA-Fort Sam Houston, TX; Christine M. Lohse, MS, Rochester, MN; Wanda L. Fussell, MD, Rochester, MN; Ashley M. Nassiri, MD MBA, Rochester, MN; Maria Vassilaki, MD PhD, Rochester, MN; Matthew L. Carlson, MD, Rochester, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the cross-sectional and time to event associations between comprehensive audiometric pure tone and speech audiometry with cognitive performance testing, mild cognitive impairment, and dementia within a study of aging.

Objectives: Hearing loss has been identified as a major modifiable risk factor for developing dementia. Thus far, data implicating hearing loss and dementia have been based on pure tone screening audiometry. This study examined associations between com-

prehensive pure tone and speech audiometry with mild cognitive impairment (MCI) and dementia in a study of aging (SA). Study Design: Prospective cohort study. Methods: The SA is a prospective, population based study examining incidence, prevalence, and risk factors of MCI and dementia. Participants undergo clinical examinations with neuropsychological testing at enrollment and every 15 months. MCI and dementia diagnoses are adjudicated by consensus among three evaluators. Participants were ГёÑ50 years old at enrollment between 2004 and 2019 and underwent comprehensive audiometric evaluation. Associations of pure tone average (PTA; 0.5, 1, 2, and 3 kHz) and word recognition scores (WRS) with MCI at enrollment and development of dementia were evaluated using logistic and Cox proportional hazards regression. Results: Among 1,200 participants, 159 had prevalent MCI and 207 developed dementia during followup. Neither PTA nor WRS were significantly associated with MCI at enrollment [ORs for 10 unit increases of 0.99 (95% CI 0.87-1.12; p=0.8) and 1.08 (95% CI 0.95-1.23; p=0.3), respectively] or with development of dementia during followup [HRs of 0.96 (95% CI 0.87-1.06; p=0.4) and 1.03 (95% CI 0.94-1.13; p=0.5), respectively] after adjusting for age, sex, years of education, and APOE ╬ 4 carriership. Conclusions: These data do not suggest a strong association between comprehensive audiometric testing and clinical diagnoses of MCI or dementia.

121. Osteocutaneous Radial Forearm Free Flap Fixed to a Prior Osteocutaneous Free Flap: A Description of Two Cases

Vivek Pandrangi, MD, Portland, OR; Jennifer Bruening, MD, Portland, OR; Daniel Petrisor, DMD MD, Portland, OR; Mark K. Wax, MD, Portland, OR

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the utilization of an osteocutaneous radial forearm free flap fixed to a prior osteocutaneous free flap for reconstruction of boney defects in which a fibula free flap is not available.

Objectives: To describe two cases in which patients who were not candidates for a fibula flap due to lower leg vascular constraints underwent boney reconstruction with an osteocutaneous radial forearm free flap (OCRFFF) fixed to a prior osteocutaneous free flap. Study Design: Case series. Methods: Retrospective review of two cases. Results: The first case describes a 72 year old woman with a history of squamous cell carcinoma (SCC) of the left retromolar trigone who previously underwent composite left mandibulectomy reconstructed with a right OCRFFF. She completed adjuvant radiation and presented with recurrence along the flap margins three years later. She underwent composite mandibulectomy with plate removal and resection of the anterior portion of the prior radial bone. This was reconstructed with a contralateral OCRFFF with a new plate inset to the native mandible at the symphysis and the remaining OCRFFF posteriorly. The second case describes a 65 year old man with history of SCC of the maxilla who underwent maxillectomy reconstructed with a rectus abdominus free flap. After radiation therapy he required facial augmentation for dental rehabilitation and underwent reconstruction with a scapular fasciocutaneous and boney lateral border free flap. He was cosmetically deficient in the premaxilla and upper lip after reconstruction, therefore an OCRFFF was onlayed to the prior scapula bone using lag screws. Conclusions: Fixing an OCRFFF to a prior osteocutaneous free flap can be an effective method to reconstruct boney defects of the head and neck for patients in whom a fibula free flap is not available to reconstruct the previous boney flap in entirety.

122. Effect of Socioeconomic Status and Comorbidity on Perceived Health Status among Otology Patients

Christine K. Raj, BA, Los Angeles, CA; Ian Kim, MFA MS, Los Angeles, CA; Francis Reyes Orozco, BS, Los Angeles, CA; Harrison J. Ma, BA, Los Angeles, CA; Ashley H. Yi, BS, Los Angeles, CA; Kevin Hur, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, participants should be able to discuss the effect socioeconomic status and comorbidity has on the perceived health status in otology patients.

Objectives: There has been limited research on the impact of social determinants of health and comorbidities among patients with otologic complaints. This study investigated the effect of perceived socioeconomic status (SES) and level of comorbidity on subjective general health (GH) in otology patients. Study Design: Cross-sectional. Methods: Patients with otology complaints at three otolaryngology clinics participated in this study. GH was measured by having patients rate their current health on a scale from 0 (worst) to 100 (best). SES was measured using the MacArthur Scale of Subjective Social Status. The Charlson Comorbidity Index (CCI) score was calculated for each patient. Demographics were self-reported. A spline regression model with one knot located at the median of the SES distribution was used to identify nonlinear SES effects. Censored least absolute deviation was used to regress GH on SES and CCI, controlling for age, gender, and ethnicity. Results: This study included 277 patients (mean age 51; 38% male; 58% Hispanic or Latino). GH increased with greater SES among patients whose SES was below the median (b=5.74, $p < 0.01$) and stabilized in those with SES above the median. Hispanic or Latino patients showed significantly lower GH (b=-7.20, $p < 0.01$). Increased CCI predicted lower GH in all patients (b=-2.07, $p < 0.05$), with a larger impact of CCI on Hispanic or Latino patients. Conclusions: Among otology patients, GH increases with SES at low SES levels, but not high SES. Additionally, interaction between ethnicity and CCI was found within this population.

123. Sex Specific Differences in Adverse Outcomes following Inpatient Thyroidectomy for Thyroid Cancer: A National Inpatient Sample Analysis

Avneet Randhawa, BS, Newark, NJ; Karandeep Singh Randhawa, BS, Newark, NJ; Christina Fang, MD FACS, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the importance of sex and its association with complications following inpatient thyroid cancer treatment.

Objectives: To analyze the association between sex and adverse outcomes in hospitalized thyroid cancer patients undergoing thyroidectomy. Study Design: Retrospective database review. Methods: This retrospective cohort analysis utilized the 2003-2014 National Inpatient Sample to identify patients with a primary diagnosis of malignant thyroid neoplasms who underwent thyroidectomy. Higher total charges and prolonged length of stay were indicated by values greater than the 90th percentile. Demographics, hospital characteristics, and complications were compared amongst male and female hospitalized patients using chi square analysis and one way ANOVA. The independent effect of sex on adverse outcomes was analyzed using logistic regression, while adjusting for the aforementioned variables. Results: 114,955 patients were identified and divided into male (n=29,309) and female (n=85,646) cohorts. Race, age, payer type, and hospital region were significantly different between sexes. Male sex was associated with longer LOS (2.06 days vs. 1.82 days, p<0.001) and greater hospital charges ($28,195.33 vs. $23,626.00, p<0.001). Further, Elixhauser comorbidity scores were higher among males compared to females (4.029 vs. 2.116, respectively p<0.001). Multivariate regression indicated that males experienced higher odds of total charges (OR 1.481, 95% CI 1.348-1.627, p<0.001) and prolonged length of stay (OR 1.131, 95% CI 1.034-1.236, p=0.007). Male patients had increased odds of any complication (OR 1.388, 95% CI 1.208-1.596, p<0.001), pulmonary complications (OR 1.411, 95% CI 1.094-1.821, p=0.008), urinary/renal complications (OR 1.879, 95% CI 1.321-2.672, p<0.001), and operative complications (OR 1.462, 95% CI 1.209-1.766, p<0.001). Conclusions: Male sex is an important demographic factor associated with increased incidence of complications following thyroidectomy in the inpatient setting.

124. Abnormal Weight Loss and Adverse Outcomes in Patients Undergoing Laryngectomy for Laryngeal Cancer

Avneet Randhawa, BS, Newark, NJ; Mehdi S. Lemdani, BA, Newark, NJ; Vraj P. Shah, BS, Newark, NJ; Karandeep Singh Randhawa, BS, Newark, NJ; Christina Fang, MD FACS, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the importance of abnormal weight loss and its association with complications following inpatient laryngeal cancer treatment.

Objectives: To analyze the association between abnormal weight loss and adverse outcomes in laryngeal cancer patients undergoing laryngectomy. Study Design: Retrospective database review. Methods: This retrospective cohort analysis utilized the 2003-2014 National Inpatient Sample. ICD-9 codes were used to identify cases with a primary diagnosis of malignant laryngeal neoplasm who underwent total or partial laryngectomy. Higher total charges and prolonged length of stay were indicated by values > the 75th percentile. Demographics, hospital characteristics, and complications were compared amongst hospitalized patients with abnormal weight loss (WL) and without abnormal weight loss (non-WL) using chi square analysis and one way ANOVA. The independent effect of WL on adverse outcomes was analyzed using logistic regression while adjusting for the aforementioned variables. Results: Of the 25,504 patients included, 14.1% (n=3592) had a diagnosis of WL. Multivariate regression indicated that WL patients were more likely to experience any complication (OR 2.859, 95% CI 2.382 -3.430, p<0.001). WL patients had increased odds of cardiac complications (OR 1.910, 95% CI 1.367 -2.670, p<0.001), pulmonary complications (OR 2.568, 95% CI 2.069 -3.188, p<0.001), nervous complications (OR 2.115, 95% CI 1.341-3.336, p=0.001), infectious complications (OR 1.497, 95% CI 1.109-2.019, p=0.008), and operative complications (OR 2.638, 95% CI 2.182 -3.190, p<0.001). Additionally, WL patients had increased odds of higher total charges (OR 2.867, 95% CI 2.361-3.481, p<0.001) and prolonged length of stay (OR 2.266, 95% CI 1.891-2.715, p<0.001). Conclusions: Abnormal weight loss is an important factor associated with increased incidence of complications in hospitalized laryngeal cancer patients undergoing laryngectomy.

125. Association between Obesity and Adverse Outcomes in Patients Undergoing Transsphenoidal Surgery

Avneet Randhawa, BS, Newark, NJ; Karandeep Singh Randhawa, BS, Newark, NJ; Christina Fang, MD FACS, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to assess the importance of obesity and its association with complications following inpatient transsphenoidal surgery.

Objectives: To analyze the association between obesity and adverse outcomes in patients with benign or malignant pituitary neoplasms undergoing transsphenoidal surgery. Study Design: Retrospective database review. Methods: The 2003-2014 National Inpatient Sample was used to identify cases with a primary diagnosis of benign or malignant pituitary neoplasm that underwent transsphenoidal surgery. Higher total charges and prolonged length of stay (LOS) were indicated by values greater than the 90th percentile. Demographics, hospital characteristics, and complications were compared among obese (body mass index ГёÑ30 kg/m2) and non-obese patients using chi square analysis and one way ANOVA. The independent effect of obesity on adverse outcomes was analyzed using logistic regression while adjusting for the aforementioned variables. Results: Of the 70,711 cases of

transsphenoidal surgery included, 12.0% (n=8,502) had a diagnosis of obesity. Race, age and median income quartile significantly differed between obese and non-obese cohorts. On average, obesity was associated with greater hospital charges ($63,184.39 vs. $57,311.91, p<0.002). Additionally, obese patients had increased odds of higher total charges (OR 1.226, 95% CI 1.020-1.474, p=0.030). Obese patients had increased odds of overall pulmonary complications (OR 1.754, 95% CI 1.253-2.455, p=0.001), such as pulmonary insufficiency (OR 3.372, 95% CI 1.846-6.157, p<0.001). Obese patients also had increased odds of central nervous complications (OR 10.170, 95% CI 1.519-68.089, p=0.017). Obese patients did not have significantly different odds of mortality or prolonged LOS compared to non-obese patients. Conclusions: Obesity is an important factor associated with increased incidence of complications following transsphenoidal surgery.

126. Adverse Outcomes following Salivary Gland Tumor Resection: Do Racial Disparities Exist?

Karandeep Singh Randhawa, BS, Newark, NJ; Avneet Randhawa, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Christina H. Fang, MD, Bronx, NY; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the importance of race and its association with complications following resection of salivary gland neoplasms.

Objectives: To analyze the association between race and adverse outcomes in patients undergoing salivary gland tumor resection. Study Design: Retrospective database review. Methods: The 2003-2014 National Inpatient Sample was used to identify cases with a primary diagnosis code of benign and malignant salivary gland neoplasms and a primary procedure code for sialoadenectomy. Values greater than the 90th percentile of the sample defined high total charges and prolonged length of stay (LOS). Chi square analysis, ANOVA, and logistic regression were utilized. Results: A total of 35,232 cases were identified, including 28,265 White, 3,743 Black, and 3,224 Hispanic cases. Chi square analysis showed that incidence of urinary complications was highest in Blacks (2.3%) and Hispanics (0.6%) compared to Whites (0.6%, p<0.001). Blacks had the highest mean LOS (Blacks 1.93 vs. Whites 1.69 vs. Hispanics 1.60 days, p=0.004), and Hispanics had the highest mean hospital charges (Hispanics $31,259 vs. Blacks $28,725 vs. Whites $26,579, p=0.001). Logistic regression analysis indicated Blacks experienced increased odds of acute venous embolism (OR 5.126, 95% CI 1.145-22.938, p=0.033), acute kidney failure (OR 10.991, 95% CI 2.663-45.358, p=0.001), and prolonged LOS (OR 1.558, 95% CI 1.234-1.967, p<0.001) compared to Whites. Hispanics faced higher odds of receiving hemodialysis (OR 5.827, 95% CI 1.942-17.482, p=0.002), operative wound disruption (OR 9.714, 95% CI 1.269-74.367, p=0.029), and high charges (OR 1.549, 95% CI 1.082-2.218, p=0.017) compared to Whites. Conclusions: Race is an important factor associated with increased odds of complications, prolonged LOS, and high charges in Black and Hispanic patients undergoing salivary gland tumor resection.

127. Sex Based Differences in Postoperative Outcomes following Sialoadenectomy of Salivary Gland Neoplasms

Karandeep Singh Randhawa, BS, Newark, NJ; Avneet Randhawa, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Christina H. Fang, MD, Bronx, NY; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the importance of biological sex and its association with complications following resection of salivary gland neoplasms.

Objectives: To analyze the association between biological sex and adverse outcomes in patients undergoing salivary gland tumor resection. Study Design: Retrospective database review. Methods: The 2003-2014 National Inpatient Sample was used to identify cases with a primary diagnosis of benign and malignant salivary gland neoplasms that underwent a primary procedure of sialoadenectomy. Values greater than the 90th percentile of the sample defined high total charges and prolonged length of stay (LOS). Chi square analysis, ANOVA, and logistic regression were used in this analysis. Results: A total of 38,702 cases were identified, including 18,613 males and 20,089 females. Chi square analysis showed that males had higher incidences of pulmonary (1.3% vs. 0.8%, p=0.019), urinary/renal (1.1% vs. 0.4%, p<0.001), and operative (3.9% vs. 2.5%, p<0.001) complications. Males also had a higher incidence of overall complications (6.9% vs. 4.6%, p<0.001). Logistic regression analysis indicated males experienced increased odds of urinary complications (OR 2.494, 95% CI 1.358-4.580, p=0.003), operative complications (OR 1.401, 95% CI 1.072-1.831, p=0.014), and all complications (OR 1.321, 95% CI 1.079-1.618, p=0.007). Specifically, males faced higher odds of acute pulmonary embolism (OR 14.444, 95% CI 2.104-99.144, p=0.007), postoperative pneumothorax (OR 8.540, 95% CI 2.519-28.949, p=0.001), operative hemorrhage (OR 1.765, 95% CI 1.275-2.444, p=0.001), insertion of short term dialysis catheter (OR 4.355, 95% CI 1.598-11.872, p=0.004), and high total hospital charges (OR 1.421, 95% CI 1.220-1.656, p<0.001). Conclusions: Biological sex is an important factor associated with complications and higher total hospital charges in patients undergoing salivary gland tumor resection.

128. Quantitative Swallowing Dynamics in Patients Undergoing Surgical Intervention for Dysphagia Due to Anterior Cervical Osteophytes

Neha K. Reddy, BA, Los Angeles, CA; Hye Rhyn Chung, BA, Los Angeles, CA; Alden F. Smith, MD, Los Angeles, CA; Timothy C. Blood, MA MD, Los Angeles, CA; Dinesh K. Chhetri, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how swallowing dynamics in videofluoroscopic swallow evaluations are affected by anterior cervical osteophytes.

Objectives: Cervical osteophytes are prevalent, and it is of interest to characterize dysphagia in patients for whom osteophytes cause symptoms requiring surgical intervention. This study quantitatively characterized swallowing dynamics in patients who received surgical intervention for anterior cervical osteophytes. Study Design: Quantitative assessment of swallowing from modified barium swallow studies (MBSS). Methods: All patients who underwent surgery for anterior cervical osteophytes causing symptomatic dysphagia were included. Patient demographics and symptomatology were obtained from chart review. Two raters independently evaluated MBSS videos using Swallowtail software. Swallow dynamics, bolus clearance ratio (BCR), and osteophyte protrusion anteriorly were measured. Swallow metrics were compared to norms matched to sex, age group (greater or less than 65), and bolus size. Results: 10 patients matched inclusion criteria, but one was excluded due to poor quality MBSS videos. All were male (mean age 69, range 57 - 83). All patients had reduced bolus clearance, and the bolus trajectory was deviated due to obstructive osteophytes. A correlation between increased duration for UES opening and increased bolus clearance appeared in patients over 65 years old (N=5). The average BCR (retained bolus) for the entire cohort was 28% (range 7% - 60%). Patients > 65 years old did not have a significantly larger BCR than patients < 65 years old. Conclusions: We present quantitative characteristics of swallows in patients undergoing surgical intervention for cervical osteophytes. Patients demonstrated sufficient average post-swallow residue to increase risk of aspiration. Older patients compensated for obstruction by increasing duration of UES opening, which reduced post-swallow residue.

129. Hearing Loss Disparities in Primary English and Non-English Speaking Patients

Francis Reyes Orozco, BA, Los Angeles, CA; Harrison J. Ma, BA, Los Angeles, CA; Brandon Yeshoua, BS, Los Angeles, CA; Christine K. Raj, BA, Los Angeles, CA; Ashley H. Yi, BS, Los Angeles, CA; Kevin Hur, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how patients who do not speak English as their primary language present with higher hearing loss severity than those who speak English as their primary language.

Objectives: While the presentation of hearing loss severity (HLS) in primarily English speaking patients has been documented, HLS in a primarily non-English speaking population has not been examined. This study aims to investigate the relationship between hearing loss severity and English fluency. Study Design: Cross-sectional study. Methods: Cross-sectional analyses of demographics and medical records were performed on adult patients seen at three otolaryngology clinics. Hearing loss severity was categorized based on pure tone average (PTA). Primary language status was assessed via questionnaires available in English, Spanish, and Chinese. Health literacy was assessed using the Brief Health Literacy Screen (BHLS). Multivariable linear regression analyses were conducted to analyze the effect of primary language status on HLS. The model was adjusted for health literacy and other sociodemographic variables. Results: The study included 133 patients (mean age 55 years; 72 percent non-English primary; 74 percent Hispanic/Latino). Patients who did not speak English as their primary language were associated with significantly higher HLS ($p < .05$) than primary English speaking patients. Health literacy was not significantly associated with hearing loss severity at presentation. Age and gender were not significantly associated with increased HLS in the multivariable analyses. Conclusions: Among otolaryngology patients with hearing loss, patients who did not speak English as their primary language were more likely to present with severe hearing loss than patients who spoke English as their primary language. Health literacy, age and gender were not significant factors in hearing loss severity.

130. Impact of Health Literacy on Health Related Quality of Life in Hearing Loss Patients

Francis Reyes Orozco, BA, Los Angeles, CA; Harrison J. Ma, BA, Los Angeles, CA; Brandon Yeshoua, BS, Los Angeles, CA; Christine K. Raj, BA, Los Angeles, CA; Ashley H. Yi, BS, Los Angeles, CA; Kevin Hur, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact of health literacy on health related quality of life.

Objectives: Health literacy has been shown to negatively affect health related quality of life (HRQoL); however, its effect on patients with hearing loss has not been studied. This study aims to investigate the effects of health literacy on health related quality of life and determine predictors of inadequate health literacy. Study Design: Cross-sectional study. Methods: Cross-sectional analyses were performed on adult patients with hearing loss evaluated at one of three otolaryngology clinics. Hearing loss severity was characterized by pure tone averages. HRQoL was evaluated by time to trade off scores. Health literacy was assessed with the Brief Health Literacy Screen; scores < 10 indicated inadequate health literacy. Multivariable regression was utilized to evaluate the association between health literacy and HRQoL, and adjusted for hearing loss severity and age. Results: Of the 133 patients evaluated (mean age 55 years; 63 percent female; 74 percent Hispanic/Latino), 32 percent (n=42) exhibited inadequate health literacy. Patients with inadequate health literacy reported significantly lower HRQoL ($p < .05$) compared to patients with adequate health literacy. Additionally, of those with inadequate health literacy, 74% had an average income of < $20,000, 81% identified as Hispanic or Latino, and 48% percent had completed only primary school or less. Conclusions: Inadequate health literacy is associated with lower HrQOL in patients with hearing loss. These patients are more likely to have lower income, lower levels of education, and identify as Hispanic or Latinos.

131. Epistaxis Rates and Epistaxis Related Healthcare Utilization in Patients with a Ventricular Assist Device

Eric Rohe, MD, Omaha, NE; Sarah Schmoker, MD, Omaha, NE; Kaeli Samson, MPH, Omaha, NE; Kristy Carlson, PhD, Omaha, NE; Jayme Dowdall, MD, Omaha, NE

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand rate of epistaxis in the ventricular assist device population; 2) understand risk factors for epistaxis in the ventricular assist device population; and 3) better understand healthcare utilization associated with epistaxis in the ventricular assist device population.

Objectives: Ventricular assist device (VAD) implantation for end stage heart failure improves both survival and quality of life. Patients receive combination anticoagulant and anti-platelet therapy which, in addition to device related factors, places them at high risk of bleeding complications. No studies have evaluated the epistaxis prevalence rate, healthcare utilization and costs associated with epistaxis in the VAD patient population. Study Design: Single institution retrospective chart review of adults who underwent VAD implantation at our institution focused on epistaxis related events. Methods: Chi square and Fisher's exact analysis were completed to identify associations between categorical variables and epistaxis. Logistic regression was used to assess associations between epistaxis and variables of interest. Results: A total of 293 patients were included in the analysis. 87 (29.6%) patients experienced an epistaxis event. A significant difference in epistaxis rate was identified between patients with GI bleeding issues and patients who did not have issues with GI bleeding (44.2% vs 29.0%; p = 0.01). The odds of experiencing at least one epistaxis event were increased by 2.06 among patients with GI bleeding (95% CI: 1.19 - 3.57, p = 0.01) and 1.84 among patients with kidney disease (95% CI: 1.07, 3.17, p = 0.03). Conclusions: VAD implantation carries a significant bleeding risk. Studies show up to 93% chronic epistaxis resolution rate with nasal moisturization routine. VAD patients would be an ideal group to target a preventative nasal hydration regimen, which has now been initiated at our institution. Healthcare utilization and cost data is currently being investigated.

132. Otologic Manifestations of Exfoliation Syndrome: A Systematic Review and Meta-Analysis

Michael C. Shih, BS, Charleston, SC; Tamar M. Gordis, BA, Charleston, SC; Shaun A. Nguyen, MD, Charleston, SC; Ted A. Meyer, MD PhD, Charleston, SC; Paul R. Lambert, MD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that exfoliation syndrome is an age related systemic disease of high prevalence. Furthermore, participants should be able to understand the impact of exfoliation syndrome on hearing loss and vestibular dysfunction.

Objectives: Exfoliation syndrome (XFS) is an age related systemic disease diagnosed by ophthalmologic exam. Epidemiologic studies conservatively estimate prevalence of XFS to be 6-27% worldwide. Although several comorbidities are associated with XFS, effects on the vestibulocochlear system remain undefined. Study Design: Systematic review and meta-analysis following PRISMA guidelines. Methods: PubMed, Scopus, CINAHL, and Cochrane Library were searched from inception through July 23, 2021. Included studies conducted audiometric, tympanometric, or vestibular evaluation on all subjects. Meta-analysis was represented as odds ratios (OR) or mean difference (MD) with 95% confidence intervals. Results: A total of 21 publications (1148 XFS and 1212 controls) were included. Greater severity of hearing loss was seen in patients with XFS compared to controls across all frequencies (MD 8.76 [7.28, 10.23], p=0.00001). Patients with XFS were more likely to have moderate to profound sensorineural hearing loss (OR 1.76 [1.25,2.45], p=0.001), and less likely to have normal hearing or mild hearing loss (OR 0.34 [0.17, 0.67], p=0.002). Those with XFS glaucoma did not have greater rates of hearing loss than those with just XFS (OR 1.72 [0.84,3.55], p=0.89). Three studies found patients with XFS had lower tympanometric peaks. Two studies found that abnormal vestibular testing results were more common for patients with XFS. Conclusions: XFS likely involves sensorineural hearing loss and vestibular dysfunction. Tympanometric findings suggest that XFS could additionally affect the middle ear. The current pathophysiologic and epidemiologic understandings of presbycusis and Meniere's disease could have been confounded by the suspected high prevalence of exfoliation syndrome and the lack of research in otologic manifestations of XFS.

133. Gunshot Injuries to the Temporal Bone

Leandro D. Socolovsky, MD, Washington, DC; Michael Bauschard, MD, Richmond, VA (Presenter); Kaitlyn Reichl, MD, Columbia, MO; Daniel H. Coelho, MD FACS, Richmond, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify patterns of injury and associated morbidities following gunshot injuries to the temporal bone.

Objectives: Despite the substantial prevalence of firearm related injuries in the United States, little is known regarding penetrating injuries to the temporal bone (TB). This study aims to better characterize the presentation and management of patients with these injuries who presented to a large, urban trauma center. Study Design: Retrospective cohort. Methods: Retrospective search of radiology reports was performed for all patients with CT reports suggestive of gunshot wounds (GSW) to the TB (2000-2020). All cases were reviewed by the senior author to confirm injury to the temporal bone. Age at injury, gender, race, associated mortality, entry site, involved temporal bone subsites, vascular injury, and retained TB foreign body were recorded. Additionally, facial nerve function, CSF leak status, hearing status, otolaryngology consultation, and management were recorded when available. Results: A total of 152 patients met inclusion criteria of whom 120 had actual images to review. The average age was 33.6. The ipsilateral

TB was the site of entry in only 54% of patients. The most commonly involved subsite was the squamosa. For those with known disposition 64.4% (96 of 149) expired on the same hospital admission. Inpatient otolaryngology consultation was noted in 20% (n = 31) of patients, with 35% (n = 11) of those patients undergoing audiologic evaluation. Outpatient followup was poor. Conclusions: This series represents the largest survey of GSW to the temporal bone to date. Although associated mortality is high and outpatient followup poor, otolaryngologists should be aware of associated morbidities to facilitate both inpatient and subsequent outpatient management.

134. Artificial Intelligence Driven Classification of Otosclerosis on Temporal Bone Histology

Christopher C. Tseng, BS, Newark, NJ; Robert W. Jyung, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss how convolutional neural networks can be utilized to detect otosclerosis within temporal bone sections.

Objectives: Otosclerosis is defined by extensive bony remodeling and vascularization, leading to characteristic histologic findings including pseudovascular spaces. Convolutional neural networks (CNNs) have been widely utilized for medical image classification research, hence this study evaluated their ability to detect otosclerosis within temporal bone sections. Study Design: Design and evaluation of an artificial intelligence driven workflow. Methods: 12 temporal bone histology whole slide images were segmented into 512 pixel x 512 pixel tiles, then each tile labeled as otosclerosis versus non-otosclerosis histology. These tiles were further divided into 80% for training, 10% for validation (to assess incremental improvement during training), and 10% for final model testing, with equivalent proportions of otosclerosis and non-otosclerosis tiles maintained. An ImageNet pretrained MobileNetV2 CNN was trained using these labeled temporal bone histology tiles, then tested on a withheld subset of tiles to evaluate their final performance. CNN intermediate activations were further extracted to visualize distinct image features. Results: A total of 15,853 tiles were included, with 1,826 otosclerosis tiles and 14,027 non-otosclerosis tiles. Following 100 training cycles, the final MobileNetV2 model demonstrated strong performance in differentiating otosclerosis compared to non-otosclerosis on the test dataset, reaching an accuracy of 96.0%, sensitivity of 72.5%, specificity of 98.9%, positive predictive value of 88.9%, and negative predictive value of 96.7%. Visualization of intermediate activations from the trained model showed good detection of relevant image features. Conclusions: While further study is necessary, these results demonstrate that artificial intelligence driven classification of temporal bone histology sections has promising utility as a research tool for guiding analysis and differentiation of otosclerosis pathology.

135. Survival Outcomes in Patients with Mycosis Fungoides Involving the External Ear and Ear Canal

Alex Jeffrey Wilkinson, BS, Houston, TX; Marc-Elie Nader, MD MSc, Houston, TX; Dianna Roberts, PhD, Houston, TX; Madeline Duvic, MD, Houston, TX; Paul W. Gidley, MD, Houston, TX

Educational Objective: The clinical manifestations of mycosis fungoides (MF) in the external ear and ear canal are poorly described in the literature, and these descriptions have been limited to case reports and small case series. At the conclusion of this presentation, participants should be able to understand the features of MF of the external ear or ear canal.

Objectives: To evaluate the impact of external ear and ear canal involvement on the outcomes of patients with MF. Study Design: Retrospective review. Methods: Retrospective review of 40 patients with MF presenting to the neurotology service. Results: We report the largest series of patients with MF involving the external ear and ear canal. Of the 40 patients analyzed, we found that 14 had MF in the ear canal, 13 of the external ear, and 1 of the preauricular skin. Of note, 11/14 (78.57%) patients presenting with ear canal disease died compared to 42.3% of patients without involvement. Also, 8/13 (61.5%) patients presenting with external ear involvement died compared to 51.85% of patients without involvement. We found that involvement of the ear canal was associated with a statistically significant worse overall survival in patients with MF (p value=0.0299). Furthermore, disease in the ear canal was found to have a hazard ratio value of 2.565 (CI 1.102-5.970). Conclusions: Involvement of the ear canal by MF portends a poor prognosis. This finding highlights the need for a more in-depth otologic evaluation of patients with MF.

136. Fully Endoscopic Resection of Intracochlear Schwannoma and Concurrent Cochlear Implantation

Kevin Wong, MD, New York, NY; Zachary G. Schwam, MD, New York, NY; Samuel Oh, MD, New York, NY; Caleb J. Fan, MD, New York, NY; Vivian Z. Kaul, MD, Columbus, OH; George B. Wanna, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the surgical steps for transcanal endoscopic resection of intracochlear schwannoma; and 2) appreciate that cochlear implantation can provide significant hearing benefits after intracochlear schwannoma removal.

Objectives: 1) Describe a fully transcanal endoscopic approach to intracochlear schwannoma resection; and 2) report audiometric outcomes following simultaneous cochlear implantation with inner ear schwannoma resection. Study Design: Case report. Methods: A 36 year old male with baseline left congenital idiopathic profound sensorineural hearing loss (SNHL) presented with a new, sudden onset right profound SNHL. Exam was unremarkable. Temporal bone imaging demonstrated a hyperintense 0.6cm lesion on T1 post-contrast magnetic resonance imaging along the basal and middle turns of his right cochlea and signal loss on T2-weighted images consistent with intracochlear schwannoma. Results: Preoperative audiometry showed right profound SNHL and 0% on word

recognition testing (NU-CHIPS) despite amplification. He underwent endoscopic transcanal, transpromontorial resection of intracochlear schwannoma with simultaneous cochlear implantation (Cochlear CI622, Sydney, Australia). Major structures of the organ of Corti and modiolus were preserved allowing for successful electrode placement. There were no postoperative complications. Activation was performed 3 weeks postoperatively with normal impendences in 20/22 electrodes; one electrode was disabled due to facial stimulation; 2 electrodes were turned off due to lack of sound perception. At his most recent followup 12 months postoperatively, he scored 56% on ipsilateral word recognition testing and responded to all sounds on Ling Six Sound testing between 10-35 dB HL. He communicates primarily through spoken language. Conclusions: A minimally invasive endoscopic approach is safe and feasible for transcanal intracochlear schwannoma resection. Simultaneous cochlear implantation after tumor resection may provide good audiologic outcomes in select cases.

137. Post-Cricoid Abscess after Intubation Presenting as Unilateral Vocal Cord Paralysis: A Case Report

Ryan Ziltzer, BS, Los Angeles, CA; Benjamin van der Woerd, MD MSc, Los Angeles, CA; Karla O'Dell, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify post-cricoid abscess as a rare underlying cause of unilateral vocal cord paralysis after laryngeal trauma such as intubation.

Objectives: To describe a rare case of post-cricoid abscess after intubation presenting as unilateral vocal cord paralysis. Study Design: Case report. Methods: A case of post-cricoid abscess after intubation presenting as unilateral vocal cord paralysis will be reported and current literature will be reviewed. Results: A 41 year old woman with a recent history of prolonged intubation during hospitalization for a cerebrovascular accident presented to the hospital with sudden onset dyspnea and one month of dysphonia, dysphagia, and neck pain. Laryngeal videostroboscopy showed right vocal fold immobility and a subglottic granuloma. CT scan showed a post-cricoid region phlegmonous process with an obstructing airway granuloma, which was surgically removed and treated with postoperative antibiotics. Her symptoms later worsened requiring readmission and airway monitoring. Repeat CT scan showed interval increase in laryngeal rim enhancing fluid collection consistent with a post-cricoid abscess. Direct microlaryngoscopy with endoscopic incision and drainage was performed. Cultures grew strep constellatus and candida albicans, and antibiotics were prescribed. Followup evaluation revealed persistent dyspnea and vocal fold paralysis, however no evidence of residual or recurrent abscess was seen on CT scan. Conclusions: This case demonstrates a post-cricoid abscess presenting as unilateral vocal cord paralysis. This is a very rare consequence of intubation. Post-cricoid abscess can cause local inflammation, dysphonia, and dyspnea and can be treated with endoscopic incision and drainage, antibiotics, and airway monitoring. Abscess recurrence may require repeat evaluation and treatment.

138. A Case of Adult Onset Idiopathic Glottic Web in a 40 Year Old Female

Suma Jouna Alzouhayli, BA, Detroit, MI; Nicole Meeks, BS, Detroit, MI; Tedean Green, MD, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should learn about a unique case report of idiopathic adult onset glottic web.

Objectives: Unique case report of idiopathic adult onset glottic web. Study Design: A previously healthy 40 year old female presented to clinic for worsening dyspnea and "whistle" noise while breathing. During the 3 months prior to presentation, she was treated for presumed allergies by her PCP with nasal spray, oral allergy medication, azithromycin, and intramuscular steroid injection resulting in no relief of symptoms. At presentation, she was noted to have audible biphasic stridor and supraclavicular retractions. Patient denied history of prior intubations, inhalation injuries, ingestion, or previous airway surgery. Methods: Flexible fiberoptic laryngoscopy (FFL) showed a 3-4-millimeter airway with subglottic narrowing. The patient was admitted from clinic to the medical ICU for airway monitoring and scheduled for direct laryngoscopy. Intraoperatively, rigid endoscope exam revealed a thin shelf consistent with a glottic web extending from the inferior surface of the anterior vocal cords to the subglottis bilaterally. After taking biopsies, a 10 mm balloon was used for web lysis. Results: Postoperative FFL showed widely patent glottis with mobile true vocal cords bilaterally. The patient was breathing well and discharged on postoperative day 1. With no clear etiologies and a positive family history for rheumatic disease, an extensive autoimmune panel was conducted. Rheumatology concluded the etiology was not autoimmune after negative workup. On postoperative day 21, she was seen in ENT clinic where she was asymptomatic. FFL showed mobile true vocal cords and no recurrent web. Conclusions: At this time, the cause of our patient's anterior glottic web is unknown. Few similar cases of idiopathic anterior glottic webs have been reported.

139. Quantitative Comparison of Soft Palate Closure in Cleft and Non-Cleft VPI Patients

Hannah Daniel, MBA, Lubbock, TX; Christina Zhu, BS, Lubbock, TX; Rahul Varman, MD, Lubbock, TX; Joshua C. Demke, MD, Lubbock, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to identify differences in soft palate closure and clinical symptoms between cleft and non-cleft VPI patients.

Objectives: To quantify differences in soft palate closure and clinical symptoms between cleft and non-cleft VPI patients. Study

Design: Retrospective review of VPI patients from 2021 to 2015. Methods: After obtaining IRB approval, a retrospective review of patient charts and imaging diagnosed with VPI who did and did not have cleft palate was performed. Demographic, speech, degree of hypernasality, and surgical intervention data were collected for each patient. Soft palate closure was quantified using dynamic MRI of the patient with simultaneous audio recording. Nasopharyngoscopy recordings were assessed for patterns in each patient. Results: The non-cleft VPI patients were generally identified at a much later age than the cleft VPI patients. Non-cleft VPI had a significantly worse initial closure than cleft VPI patients. Patients with non-cleft VPI had better post-surgical outcomes. There was no difference in hypernasality observed between cleft and non-cleft VPI patients. Conclusions: When determining treatment for an individual with VPI, it may be important for a physician to consider if the patient had a history of cleft palate repair.

140. An ex vivo Investigation of Angle, Moisture, and Compressions on Tactile Aesthesiometer Force in Laryngopharyngeal Sensory Testing

Joseph Kidane, BS, San Francisco, CA; Grant Gochman, MS, San Francisco, CA; W. John Boscardin, PhD, San Francisco, CA; Clark A. Rosen, MD, San Francisco, CA; VyVy N. Young, MD, San Francisco, CA; Yue Ma, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the effect of monofilament size, saliva, successive monofilament compressions, and angles of tissue contact on stimulus force delivered when evaluating laryngopharyngeal sensation.

Objectives: Nylon monofilaments have been used to deliver stimuli to the laryngopharynx and objectively evaluate sensation. Ambiguity surrounds the transformation of tactile force in the laryngopharyngeal environment. The objective of this study is to evaluate the effect of filament size, saliva, successive monofilament compressions, and angles of tissue contact on stimulus force delivered. Study Design: Ex vivo study using cadaveric buccal mucosa model. Methods: An ex vivo stimulus delivery device was constructed to directly measure tactile force of various monofilaments in different environments. Dry and saliva saturated monofilaments (6-0, 5-0, 4.5-0, and 4.0-0) were each compressed six times on a thin section of cadaveric buccal mucosa zeroed on an electronic balance (0.0001g readability). The corresponding force for each compression was recorded at 0, 15, 30, 45, 60 degrees from the vertical plane. 240 total compressions were analyzed utilizing a mixed effects statistical model. Results: Increasing filament size positively correlated with tactile force. The mean force in grams (g) delivered for the 6-0, 5-0, 4.5-0, and 4.0-0 monofilaments were 0.017, 0.082, 0.120, and 0.268 g respectively (p value less than 0.001). Mean force was significantly reduced at a 60 degree angle of contact (p=0.002). Tactile force decreased with successive compressions (mean decrease per compression 0.004g, p value less than 0.001). The effect of saliva was insignificant (p=0.83). Conclusions: We found that up to 45 degrees deviation from orthogonal tissue contact and salivary forces do not significantly alter tactile stimuli delivered by nylon monofilaments. Repeated compressions of monofilaments decrease force delivered, but this is insignificant given the present finite testing protocol for laryngopharyngeal sensory testing.

141. Congenital Palatal Mass

Tyler Alise Le, Cupecoy, St. Maarten; Nicole Favre, BA, Buffalo, NY; Michele Carr, MD DDS PhD, Buffalo, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to develop an understanding of how palatal lesion may present in order to properly plan for management.

Objectives: Describe in detail the unexpected finding of a supernumerary tooth within a congenital palatal lesion. Study Design: Study design. Methods: Study design and literature review. Results: A 14 month old male presented with a congenital midline palatal lesion visible behind his newly erupted maxillary central incisors. It was round, raised, firm, and covered with normal appearing mucosa. It had grown faster than he had but was not interfering with function. CT imaging suggested that it was a rudimentary tooth crown. It was excised and confirmed to be a supernumerary tooth. He healed up without complications. The literature concerning primary supernumerary tooth presentation and differential diagnosis of congenital oral lesions is reviewed. Supernumerary teeth typically occur in the alveolar ridge. Most commonly encountered possibilities for congenital palatal lesions with this appearance are hamartoma, cyst, epulis and teratoma. Conclusions: Congenital midline palatal lesions are uncommon and supernumerary teeth are not typically in the differential diagnosis. Imaging is helpful in planning management of congenital palatal lesions.

142. Relationship between Resilience, Self-Efficacy, and Ethnicity on Health Related Quality of Life in Patients with Hearing Loss

Francis Reyes Orozco, BA, Los Angeles, CA; Harrison J. Ma, BA, Los Angeles, CA; Brandon Yeshoua, BS, Los Angeles, CA; Christine K. Raj, BA, Los Angeles, CA; Ashley H. Yi, BS, Los Angeles, CA; Kevin Hur, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how resilience and self-efficacy impact quality of life in Hispanic or Latino patients with hearing loss.

Objectives: The positive effects of self-efficacy and resilience on health related quality of life (HRQoL) are well established, but the effect of ethnicity on this relationship is not well known. This study aims to investigate how ethnicity interacts with resilience and

self-efficacy to affect HRQoL among patients with hearing loss (HL). Study Design: Cross-sectional study. Methods: Cross-sectional analyses were performed on adults with HL seen at three otolaryngology clinics. Hearing loss severity was categorized based on pure tone average. HRQoL was assessed by time to tradeoff scores, resilience was assessed using the Brief Resilience Scale, and self-efficacy was assessed using the General Self-Efficacy Scale. The effect of resilience, self-efficacy, and ethnicity on HRQoL was analyzed via univariable and multivariable regression. Results: The study included 133 patients (mean age 55 years; 63 percent female; 74 percent Hispanic/Latino). On univariate analyses, patients with higher resilience and self-efficacy reported significantly higher HRQoL ($p < .001$ and .05, respectively). Hispanic/Latino patients were associated with significantly lower HRQoL on univariate and multivariate analyses ($p < .01$ and .05 respectively). On multivariable analyses, higher resilience was associated with significantly higher HRQoL ($p < .001$), but self-efficacy was not significantly associated with HRQoL when adjusting for ethnicity. Age, gender, and HL severity were not significantly associated with HRQoL on multivariable analyses. Conclusions: Among otolaryngology patients with hearing loss, higher resilience is associated with higher HRQoL. Hispanic/Latino patients have significantly lower HRQoL than non-Hispanic or Latinos. The predictive effect of self-efficacy on HRQoL is associated with other predictors such as ethnicity and resilience.

143. Ear Salvage Using Leech Therapy after Traumatic Avulsion Injury

Meryam Shikara, MD, Baltimore, MD; Suneet Waghmarae, BA, Baltimore, MD; Natalie Justicz, MD, Baltimore, MD; Kalpesh T. Vakharia, MD MS, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the use of leech therapy to successfully salvage an ear after near complete traumatic avulsion injury.

Objectives: To describe a case of successful ear salvage using leech therapy after near complete avulsion injury. Study Design: Case report. Methods: This is a retrospective case report of a 32 year old male who was struck by a motor vehicle and sustained a near complete avulsion injury of the left ear with a complex 20 centimeter temporoparietal scalp degloving laceration. There was approximately 5cm of tissue holding the auricle to the scalp. The patient was taken to the OR emergently for debridement and wound exploration. The patient was not interested in cartilage harvest and delayed reconstruction and was interested in salvaging the ear with primary repair. In the operating room, small temporal vessels were identified and trimmed with no sufficient bleeding. No vessels were identified as candidates for primary microvascular anastomosis. The concha cava cartilage was fractured in multiple segments extending to the root of the helix. After debridement, the cartilaginous subunits were repaired. The auricle was reattached to the scalp in multiple layers. Results: Following primary repair, leech therapy was initiated immediately postoperatively to manage venous congestion. Leech therapy was used for five days with reapplication of leeches every two hours. Hemoglobin was monitored and the patient was started on prophylactic antibiotics. This resulted in successful salvage of the ear with good cosmetic results. He was discharged on postoperative day five. He had excellent healing at his one week and four week followup visits. Conclusions: Leech therapy can be used for ear salvage after traumatic avulsion injury to help with external venous decompression.

144. Diagnosis of Mastoiditis in the Emergency Room

Priya Uppal, BS BA, Albany, NY; Tejas Kollu, BS, Albany, NY; Tam Ramsey, MD, Albany, NY; Rafael Cardona Rodgriuez, MD, Albany, NY; David Foyt, MD, Albany, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to have a deeper understanding of how to effectively diagnose mastoiditis and the importance of using a detailed history and physical exam to do so.

Objectives: History and physical examination are the most important elements in diagnosing mastoiditis and should be mastered by healthcare workers to prevent overutilization of imaging and exposing patients to unnecessary radiation. Study Design: A retrospective study of approximately 500 patients of all ages from 1/1/2015 to 12/31/2019 that presented to the emergency room for ear complaints with ICD 10 codes of H60 to H95 at a single medical center were included. Methods: Patient charts were reviewed for imaging and if there was any mention of mastoiditis in the radiology report. It was also determined if patients received an otolaryngology consult. Results: There was a total of 393 patients who met inclusion criteria, 160 pediatric patients (age 21 or younger) and 321 adults (over age 21). The average age of our study population was 29 years old; 51.65% of patients were female. 56 (14.25%) patients received a CT scan, of which 27 patients received CT of their temporal bones. Overall 24 people had the diagnosis of mastoiditis as interpreted by the radiologist, with 16 of these patients receiving otolaryngology consult; of which 4 were admitted to the otolaryngology service for further evaluation and management. A total of 10 mastoiditis patients were found in the entire study group and admitted with the rest of the diagnoses being a mix of otitis externa, otitis media and cellulitis. Conclusions: We recommend orientation and increased awareness of the clinical nature of diagnosing mastoiditis in the hopes of decreasing healthcare costs by lowering the number of imaging studies and number of consults.

145. Effects of Essential Oils on Scars and Wound Healing: A Systematic Review

James C. Wang, MD PhD, Chicago, IL; Callie L. Fort, BS MBA, Lubbock, TX; Christina Matl, MS, Lubbock, TX; Bailey D. Harvey, BS, Lubbock, TX; Joshua C. Demke, MD, Lubbock, TX; Douglas M. Sidle, MD, Chicago, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize that essential oils have

shown preliminary efficacy in reducing pain, erythema, and percent wound reduction. Essential oils have also shown improvement in preexisting scar attributes.

Objectives: The purpose of this study is to provide a comprehensive review of clinical studies that examine the wound healing effects of essential oils, evaluating the reduction of skin scar tissue specifically. Study Design: Systematic review. Methods: PubMed, Cochrane, Ovid and Embase computerized searches were performed. Two independent reviewers conducted data extraction following a predetermined protocol identifying articles that examined the healing effects of essential oils on 47 wounds/scars. Search results were additionally reviewed by the senior author. Results: Three articles testing 3 different essential oil preparations were included in the final analysis. The efficacy of EOs in the treatment of wounds/hypertrophic scars was evaluated for facial/scalp burns, cesarean sections, and surgical incisions/scars of head, face, elbows, and ankles. Controls included: wheat germ oil, petroleum jelly, and no control. The outcomes that were tested include: healing rate, erythema, pain, pruritus, patient discomfort, physician satisfaction, percent wound reduction, wound/scar surface perimeter area, and qualitative dermatological evaluation. Conclusions: Despite differences in study design, all three articles concluded that the essential oils used resulted in either superior or non-inferior outcomes in comparison to the control. No patients reported adverse outcomes while using essential oils. The hypericum calendula preparation obtained lower wound surface perimeter area in comparison to the control. Pain (p=<.001) and erythema (<.001) were significantly decreased by the peppermint oil preparation in comparison to the control (petroleum jelly). Physicians reported greater satisfaction (p=<.001) in wound appearance with use of the peppermint essential oil preparation. Additionally, pracaxi oil was shown to reduce the appearance of preexisting facial scars.

TRIOLOGICAL SOCIETY NATIONAL AWARDS

The Triological Society Gold Medal

1933. . . . . Max. A. Goldstein, MD
2001. . . . . Byron J. Bailey, MD
2005. . . . . Michael M.E. Johns, MD
2009. . . . . Patrick E. Brookhouser, MD
2013. . . . . Harold C. Pillsbury, MD

Patrick E. Brookhouser, MD Award for Excellence

2013. . . . . Gerald B. Healy, MD FACS
2014. . . . . H. Bryan Neel III, MD PhD FACS
2015. . . . . Robert H. Miller, MD MBA FACS
2016. . . . . Frank E. Lucente, MD FACS
2017. . . . . Charles M. Luetje, MD FACS
2018. . . . . Roger L. Crumley, MD MBA FACS
2019. . . . . Stanley M. Shapshay, MD FACS
2020. . . . . Jonas T. Johnson, MD
2021. . . . . none--virtual meeting
2022. . . . . Robert H. Ossoff, DMD MD FACS

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1901 to 1906 . . . . . Wendell C. Phillips, MD
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1936 to 1962 . . . . . C. Stewart Nash, MD
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1993 to 1996 . . . . . Robert H. Miller, MD
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2006 to 2011 . . . . . Patrick E. Brookhouser, MD
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1896. . . . . Edward B. Dench, MD
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1914. . . . . Joseph A. White, MD
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1917. . . . . Thomas J. Harris, MD
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1920. . . . . Harris P. Mosher, MD
1921. . . . . Lee Wallace Dean, MD
1922. . . . . Lewis A. Coffin, MD
1923. . . . . Dunbar Roy, MD

PRESIDENTS cont'd

1924. . . . . Hanau W. Loeb, MD
1925. . . . . William H. Haskin, MD
1926. . . . . John M. Ingersoll, MD
1927. . . . . Burt R. Shurly, MD
1928. . . . . John F. Barnhill, MD
1929. . . . . Hill Hastings, MD
1930. . . . . Ross Hall Skillern, MD
1931. . . . . Max A. Goldstein, MD
1932. . . . . Edmund Prince Fowler, MD
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1934. . . . . J.W. Jervey, MD
1935. . . . . Perry G. Goldsmith, MD
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1937. . . . . George M. Coates, MD
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1943. . . . . James G. Dwyer, MD
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1945. . . . . Albert C. Furstenberg, MD
1946 . . . . . Albert C. Furstenberg, MD
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1948. . . . . Lyman G. Richards, MD
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1950. . . . . Robert C. Martin, MD
1951. . . . . Louis H. Clerf, MD
1952. . . . . C. Steward Nash, MD
1953. . . . . Francis E. LeJeune, MD
1954. . . . . Leroy A. Schall, MD
1955. . . . . Kenneth M. Day, MD
1956. . . . . Dean M. Lierle, MD
1957. . . . . Percy E. Ireland, MD
1958. . . . . Lawrence R. Boies, MD
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1960. . . . . Theodore E. Walsh, MD
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1962. . . . . John R. Lindsay, MD
1963. . . . . Howard P. House, MD
1964. . . . . John E. Bordley, MD
1965. . . . . George E. Shambaugh, Jr., MD
1966. . . . . Francis W. Davison, MD
1967. . . . . Shirley H. Baron, MD
1968. . . . . G. Slaughter Fitz-Hugh, MD
1969. . . . . Jerome A. Hilger, MD
1970. . . . . Joseph L. Goldman, MD
1971. . . . . Victor Goodhill, MD
1972. . . . . Victor R. Alfaro, MD
1973. . . . . Walter P. Work, MD
1974. . . . . Raymond E. Jordan, MD
1974. . . . . Louis E. Silcox, MD
1975. . . . . David D. DeWeese, MD
1976. . . . . James A. Harrill, MD
1977. . . . . Joseph H. Ogura, MD
1978. . . . . Daniel Miller, MD
1979. . . . . Francis A. Sooy, MD
1980. . . . . Beverly W. Armstrong, MD
1981. . . . . G. O'Neill Proud, MD
1982. . . . . John A. Kirchner, MD
1983. . . . . Robin Michelson, MD
1984. . . . . Carl N. Patterson, MD
1985. . . . . William H. Saunders, MD
1986. . . . . Wesley H. Bradley, MD
1987. . . . . Roger Boles, MD
1988. . . . . Harold G. Tabb, MD
1989 . . . . . Malcolm H. Stroud, MD
1990. . . . . M. Stuart Strong, MD
1991. . . . . Paul H. Ward, MD
1992. . . . . A. Paul Keller, Jr., MD
1993. . . . . Frank N. Ritter, MD
1994. . . . . Richard R. Gacek, MD
1995. . . . . Patrick J. Doyle, MD
1996. . . . . William R. Hudson, MD
1997. . . . . H. Bryan Neel, MD
1998. . . . . Stanley M. Blaugrund, MD
1999. . . . . Mansfield F. W. Smith, MD
2000. . . . . Charles W. Gross, MD
2001. . . . . Edward L. Applebaum, MD
2002. . . . . Gerald B. Healy, MD
2003. . . . . Roger L. Crumley, MD
2004. . . . . Robert A. Jahrsdoerfer, MD
2005. . . . . Patrick E. Brookhouser, MD
2006. . . . . Stanley M. Shapshay, MD
2007. . . . . David F. Wilson, MD
2008. . . . . Harold C. Pillsbury, MD
2009. . . . . Myles L. Pensak, MD
2010. . . . . Frank E. Lucente, MD
2011. . . . . Gerald S. Berke, MD
2012. . . . . Robert H. Ossoff, DMD MD
2013. . . . . Jesus E. Medina, MD
2014. . . . . Jonas T. Johnson, MD FACS
2015. . . . . Derald E. Brackmann, MD
2016. . . . . Fred D. Owens, MD
2017. . . . . Charles W. Beatty, MD FACS
2018. . . . . Mark S. Persky, MD FACS
2019. . . . . Sigsbee W. Duck, MD FACS
2020/2021 . . . . . C. Gaelyn Garrett, MD
2022. . . . . Michael S. Benninger, MD FACS

GUESTS OF HONOR

1947 . . . . . J. McKenzie Brown, MD
1948. . . . . Harold Walker, MD
1949. . . . . Claude C. Cody, Jr., MD
1950. . . . . Harris P. Mosher, MD
1951. . . . . Duncan McPherson, MD
1952. . . . . D.C. Jarvis, MD
1953. . . . . Charles A. Thigpan, MD
1954. . . . . J. Parsons Schaeffer, MD
1955. . . . . Edward P. Fowler, MD
1956. . . . . Harold L. Lillie, MD
1957. . . . . Not Available
1958. . . . . Arnold S. Diehl, MD
1959. . . . . Frederick T. Hill, MD
1960. . . . . Terence Cawthorne, MD
1961. . . . . Milton J. Robb, MD
1962. . . . . Thomas C. Galloway, MD
1963. . . . . Robert C. Martin, MD
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1971. . . . . Vern O. Knudsen, PhD
1972. . . . . Carlos Munoz-MacCormick, MD
1973. . . . . Dean Lierle, MD
1974. . . . . Raymond Jordon, MD
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1976. . . . . John Bordley, MD
1977. . . . . Max Soni, MD
. . . . . W.E.N. Harrison, MD
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1995. . . . . Paul H. Ward, MD
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1999. . . . . Richard L. Goode, MD
2000. . . . . A. Paul Keller, MD
2001. . . . . Charles W. Cummings, MD
2002. . . . . Stanley M. Shapshay, MD
2003. . . . . Brian F. McCabe, MD
2004. . . . . Byron J. Bailey, MD
2005. . . . . Robert H. Miller, MD MBA
2006. . . . . Gerald B. Healy, MD
2007. . . . . William F. House, MD
2008. . . . . Patrick E. Brookhouser, MD
2009. . . . . Harry R. van Loveren, MD
2010. . . . . Gady Har-El, MD
2011. . . . . Harold C. Pillsbury, MD
2012. . . . . Paul A. Levine, MD
2013. . . . . Robert H. Mathog, MD
2014. . . . . Michael M.E. Johns, MD
2015. . . . . Gerald S. Berke, MD FACS
2016. . . . . William H. Owens
2017. . . . . H. Bryan Neel, III, MD PhD FACS
2018. . . . . Dana M. Thompson, MD FACS
2019. . . . . Harold C. Pillsbury, MD FACS
2020. . . . . cancelled due to COVID
2021. . . . . Mark S. Courey, MD
2022. . . . . Robert T. Sataloff, MD FACS

JOSEPH H. OGURA, MD LECTURERS

1986 . . . . . Hugh F. Biller, MD
1987. . . . . Paul H. Ward, MD
1988. . . . . John Conley, MD
1989. . . . . George A. Sisson, MD
1990. . . . . Sir Donald F.N. Harrison
1991. . . . . Robert W. Cantrell, MD
1992. . . . . Michael E. Johns, MD
1993. . . . . John A. Kirchner, MD
1994. . . . . John Lewis, MD
1995. . . . . Eugene Myers, MD
1996. . . . . Charles W. Cummings, MD
1997. . . . . Harold C. Pillsbury III, MD
1998. . . . . Frank E. Lucente, MD
1999. . . . . Haskins Kashima, MD
2000. . . . . Christopher Perry, MD
2001. . . . . Richard R. Gacek, MD
2002. . . . . David G. Nathan, MD
2003. . . . . Arnold G. D. Maran, MD
2004. . . . . Ernest A. Weymuller, Jr., MD
2005. . . . . Gerald B. Healy, MD
2006. . . . . Jonas T. Johnson, MD
2007. . . . . Byron J. Bailey, MD
2008. . . . . Paul A. Levine, MD
2009. . . . . Robin T. Cotton, MD
2010. . . . . Marvin P. Fried, MD
2011. . . . . Lord Bernard Ribeiro Kt CBE FRCS FACS (Hon.)
2012. . . . . James L. Netterville, MD
2013. . . . . Randal S. Weber, MD
2014. . . . . David E. Eibling, MD FACS
2015. . . . . Uttam K. Sinha, MD FACS
2016. . . . . Jonas T. Johnson, MD FACS
2017. . . . . Eric J. Moore, MD FACS
2018. . . . . Dana M. Thompson, MD FACS
2019. . . . . James P. Bagian, MD PE
2020. . . . . cancelled due to COVID
2021. . . . . C. Buddy Creech, MD MPH
2022. . . . . Lara Jehi, MD MHCDS

IN MEMORIAM

The following deaths have been reported to the Administrative Office since the publication of the 2019 Annual Program.

	Elected	Died
Kenji Aimi, MD - Littleton, CO	1976	2011
Thomas P. Belson, MD FACS - Elm Grove, WI	1983	2020
Michael Broniatowski, MD FACS - Cleveland Heights, OH	1988	2021
Sidney N. Busis, MD FACS - Pittsburgh, PA	1965	2019
C. Phillip Daspit, MD FACS - Phoenix, ZA	1994	2022
Bert A. De Bord, Jr., MD - Temple, TX	1953	2013
Herbert H. Dedo, MD - Hillsborough, CA	1970	2021
Lawrence W. De Santo, MD - Scottsdale, AZ	1980	2020
Robert A. Dobie, MD - San Antonio, TX	1983	2019
George W. Facer, MD- Bonita Springs, FL	1993	2020
MaryAnn S. Frable, MD - Richmond, VA	1972	2020
Jacob Friedberg, MD - Toronto, ON Canada	1993	2021
William M. Gatti, MD FACS - Deerfield, IL	1980	2022
Jerome C. Goldstein, MD FACS - Wellington, FL	1982	2019
Richard L. Goode, MD FACS - Los Altos Hills, CA	1974	2019
Raymond L. Hilsinger Jr., MD FACS - Orinda, CA	1985	2019
Melton J. Horwitz, MD FACS - Houston, TX	2007	2019
Arthur J. Kuhn, MD - Naples, FL	1966	2021
Francis E. LeJeune Jr., MD FACS - River Ridge, LA	1972	2021
David J. Lim, MD - Los Angeles, CA	1972	2018
Fred H. Linthicum Jr., MD - Malibu, CA	1961	2020
Louis D. Lowry, MD - Lansdale, PA	1981	2021
Frederick M. S. McConnell, MD - Atlanta, GA	1987	2021
Thomas J. McDonald, MD FACS - Rochester, MN	1982	2019
Elie E. Rebeiz, MD FACS - Boston, MA	2018	2021
Wm. Russell Ries, MD FACS - Nashville, TN	2000	2021
Richard R. Royer, MD FACS - Grosse Pointe, MI	1975	2016
Isamu Sando, MD - Pittsburgh, PA	1976	2014
Clarence T. Sasaki, MD FACS - New Haven, CT	1979	2021
Howard W. Smith, MD DMD FACS - New York, NY	1968	2020
M. Stuart Strong, MD - Boston, MA	1962	2019
Donald P. Vrabec, MD- Danville, PA	1973	2021
Roger E. Wehrs, MD - Tulsa, OK	1975	2021
Louis W. Welsh, MD - Huntingdon Valley, PA	1970	2020